THE

PENNY CYCLOPÆDIA

OF

THE SOCIETY

FOR THE

DIFFUSION OF USEFUL KNOWLEDGE.

VOLUME VI.

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BUFFON, GEORGE LOUIS LE CLERC, COMTE DE, son of Benjamin Le Clerc Buffon, a councillor of parliament, was born at Montbard, in Burgundy, on the 7th September, 1707, a year which was also marked by the entrance of Linné into life. We first trace the young Buffon at Dijon, where he was entered at the Jesuits' college as a student of law; but it would appear that the legal profession, which his father wished him to adopt, had no charms for him, and that astronomy and mathematics were his favourite pursuits. The parent, observing his son's disgust at the former study and his zealous application to the last-named sciences, wisely suffered him to follow the path which he had chosen; and he became so wedded to his geometry that some of his biographers assert, that while his companions were at their sports he was generally to be seen in some retired nook poring over his pocket Euclid, which he seems to have cherished at this early age with no less affection than Parson Adams had for his Æschylus. Such a mode of spending hours, which would otherwise have been hours of idleness, brought forth its fruits in due season, and there are stories current that he had anticipated Newton in some of his discoveries, but that he withheld his claim, observing that people were not obliged to believe the assertion. We receive these *on dits* with some grains of allowance, for, to say nothing of dates, vanity was certainly not absent as an ingredient in Buffon's character.

An acquaintance which he had made with Lord Kingston and his tutor, at Dijon, soon ripened into friendship, and Buffon travelled through Italy with these companions, the latter of whom appears to have been a man of science, while the former was the ready partner in his pleasures. The death of his mother, whom he lost during this expedition, put him in possession of a large income, nearly 12,000*l.*, at an early age, and having become entangled in some affair, on his return to Montbard, he found it advisable to leave that place; and he accordingly went to Paris, and visited England. We do not find him settled on his estate 'for good' till the age of twenty-five. In this retirement he resolutely pursued his studies, and as it may not be uninteresting to those who think life was not given to us to be passed in mere frivolities, to know how Buffon passed his time, we select the following account from a modern biographer, premising that the history of one day seems to have been that of all the others, generally speaking, throughout a period of fifty years. 'After he [illegible]ssed he dictated letters, and regulated his domestic affa[illegible] and at six o'clock he retired to his studies at the pavilion called the Tower of St. Louis. This pavilion was situated at the extremity of the garden, about a furlong from the house, and the only furniture which it contained was a large wooden secretary and an arm-chair. No books or pictures relieved the naked appearance of the apartment, or distracted the thoughts of the learned possessor. The entrance was by green folding-doors, the walls were painted green, and the interior had the appearance of a chapel, on account of the elevation of the roof. Within this was another cabinet, where Buffon resided the greater part of the year, on account of the coldness of the other apartment, and where he composed the greater number of his works. It was a small square building, situated on the side of a terrace, and was ornamented with drawings of birds and beasts. Prince Henry of Prussia called it the cradle of natural history; and Rousseau, before he entered it, used to fall on his knees and kiss the threshold. At nine o'clock Buffon usually took an hour's rest; and his breakfast, which consisted of a piece of bread and two glasses of wine, was brought to the pavilion. When he had written two hours after breakfast, he returned to the house. At dinner he spent a considerable portion of time, and indulged in all the gaieties and trifles which occurred at table. After dinner he slept an hour in his room, took a solitary walk, and, during the rest of the evening, he either conversed with his family or guests, or sat at his desk examining the papers which were submitted to his judgment. At nine o'clock he went to bed to prepare himself for the same routine of judgment and pleasure.' Among his other studies the alleged burning of the Roman fleet, under Marcellus, by Archimedes, on its approach within bow-shot, by means of mirrors, attracted his attention, and he commenced a series of experiments, with the view of verifying the fact. After several experiments and considerable expense, he constructed a great mirror, composed of 168 pieces of plain silvered glass, six inches by eight. Between each was an interval of four lines. These intervals gave the experimentalist a view of the point on which the machine was to be directed, and the contrivance allowed of extensive motion; for the whole of the pieces were set in an iron frame, with an apparatus of screws and springs. Having made his preparations he commenced his experiments, and, on the 23rd of March, a plank of beech, which had been covered with tar, was set on fire at the distance of sixty-six feet, only forty mirrors being brought to bear on it, and without their being set in the stand. On the same day ninety-eight mirrors, under some disadvantageous circumstances, ignited a tarred and sulphured plank, at the distance of 126 feet. On the 3rd of April, at 4 o'clock p.m., a board, covered with small pieces of wool, was placed at the distance of 138 feet, and the rays from 112 mirrors slightly inflamed it. The next day, at 11 o'clock a.m., 154 mirrors caused a tarred plank, fixed at a distance of 150 feet, to smoke densely in two minutes; but just as the experimentalists were expecting it to burst into flame, the sun was obscured. At 3 o'clock, on the 5th of the same month, 154 mirrors fired small sulphured chips of deal, mingled with charcoal, at the distance of 250 feet, when the day was not bright: a few seconds were sufficient to produce ignition when the sun shone powerfully. An unclouded and clear sun, soon after mid-day of the 10th of April, inflamed very suddenly a tarred fir-plank, the distance being 150 feet, and the number of mirrors brought into action being 128; at half-past two on the same day a beech plank, partially sulphured, and covered in other parts with small pieces of wool, was inflamed so suddenly and strongly that it became necessary to plunge it into water for the purpose of quenching the fire: 148 mirrors performed this at a distance of 150 feet. On the 11th of April some small combustibles were ignited by 12 mirrors, at 20 feet; a large pewter flask, 6 lbs. in weight, was melted by 45 mirrors at the same distance, and some thin pieces of silver and iron were brought to a red heat by 117. These experiments led him to others, having for their object the structure of mirrors by bending glass upon spherical moulds; but his great difficulty appears to have been encountered in the cooling and grinding, and only three, it is said, were preserved out of twenty-four. He presented one of these, having a diameter of 46 inches, and considered as the most powerful burning-glass in Europe, to the King of France.

Hitherto we have seen Buffon devoting himself to his studies with unwearied diligence; but the more abstruse of the sciences and the formation of his style appear to have almost entirely occupied him up to a certain period.

Some few years, however, before he commenced the experiments above recorded, he was, at the age of thirty-two (about the year 1739), called to succeed M. Dufay, who, struck by a mortal disease (the small-pox), had recommended Buffon to the minister as the only man capable of following up his projects in the office of intendant of the Royal Garden and Museum, where he planted the two avenues of lime-trees which terminate towards the extremity of the nursery, and mark the limits of the garden at that period. The appointment seems to have at once awakened his dormant love for the study of natural history. His ardent mind took an immediate and comprehensive view of the subject, and commencing with the theory or history of the earth as his basis, he followed it out through the great work which has immortalized his name as a zoologist, calling to his assistance the talents of men who were most deeply versed in particular branches of the study:—the names of Daubenton and Lacépède stand pre-eminent among those who were thus associated with him.

His marriage with Mademoiselle de Saint Belin, in 1762, appears to have been productive of great happiness to both parties, for she is recorded as anxiously watching all his steps on the road to fame, and rejoicing with him at the honours which were showered upon him by crowned heads and learned societies. Louis XIV., in 1776, raised his estate into a compté, and invited him to Fontainebleau, with a view of inducing him to accept the office of Administrator of the Forests of France, but Buffon declined the office.

His days appear to have been passed in great tranquillity, uninterrupted till a late period of his life, when that cruel disease, the stone, came to imbitter the rest of it. This torturing malady seems to have become seriously distressing about his 73rd year. He was importuned to submit to an operation, but he never would consent, though his medical attendants assured him of relief: their opinion, it is stated, was confirmed on examination after his death, which took place on the 16th of April, 1788, at the age of 81, after eight years of intense suffering. Fifty-seven stones, some of them as large as a bean, are said to have been found in his bladder.

His body was embalmed, and placed in the same vault with that of his wife, at Montbard.

The respect paid to his memory was great, and reflected honour on the assemblage of academicians and persons of rank and distinction who followed his remains to the tomb. It is said that above 20,000 people had congregated to see the funeral pass.

Condorcet, Broussonet, Vicq d'Azyr, and Lacépède were his principal eulogists.

Buffon left an only son, whose abilities were considerable, and whose attachment to his parent was extreme, if indeed filial love can ever be extreme. He was in the army, and had risen to the rank of major in the regiment of Angoumois. We have seen the father's obsequies celebrated by the great and good, and attended by the people; but this homage to a great genius was soon to give way to the storm that darkened the political horizon of all Europe. The son of the great Comte de Buffon expiated the crime of his birth on the scaffold which had already reeked with the noblest blood of France; and even the bones of the father—the man whom the people had delighted to honour—could not escape desecration. The remains of the illustrious zoologist were torn from the grave; the lead in which he was hearsed was plundered, and his monument was razed to the ground. It is confidently stated, that among the frenzied populace who perpetrated this sacrilege were many of his own retainers—of those who had followed him to that very grave with reverential mourning. Nor were this baseness and disgrace confined to a host of furious madmen, drunk with political excitement; for when a citizen, to whom science was dear, complained to the Committee of Public Instruction of the outrage, and proposed that Buffon should have a place in the Pantheon, he was answered that the temple would be profaned by the presence of one who had been connected with the aristocracy of France.

The character of Buffon's mind seems to have been comprehensive, exhibiting an insatiable desire of knowledge joined with a persevering fondness and appetite for study rarely to be found: to these gifts nature had added a most fervid imagination, and his biographers have superadded no small portion of vanity. If by vanity be meant an anxious solicitude for a literary immortality, 'that last infirmity of noble minds,' which was continually betraying itself, Buffon was without doubt a vain man. He would read to his visiters those passages in his works which were his greatest favourites, such as portions of his natural history of man, the description of the Arabian deserts in the account of the camel, and his poetical pages on the swan. The last affected Prince Henry of Prussia, to whom the author read it when he was on a visit to Montbard, so strongly that he sent to the zoologist a service of porcelain on which swans were represented in almost every attitude.

Buffon was of a noble countenance and commanding figure, and his fondness for magnificence and dress seem to have amounted almost to a passion. It is curious to observe such an intellect as his finding time in the midst of the severest studies to submit his head to the friseur often twice and sometimes three times in the day, and to make his toilet in the extreme of the fashion. On a Sunday, after the service of the church, the peasantry of Montbard came to gaze on the count, who, clad in the richest dress, and at the head of his son and retainers, was wont to exhibit himself to their admiring eyes. This last exhibition however may have been a trait of the times.

His devotion to study soon ripened into a habit, and became his solace under the excruciating torments which imbittered the last years of his life. When asked how he had found time to do so much, he would reply, 'Have I not spent fifty years at my desk?'

Buffon's style was brilliant and eloquent even to the verge of poetry; and it is worthy of remark that a mind which had been trained and disciplined in the severity of the exact sciences should surrender the reins so entirely to the most luxuriant but wildest imagination. Hence, as is observed in the article on birds, he was often arraigning nature at the bar of his fancy for some supposed defect of design, when the fault was in his own want of perception of the end to which that design was directed, arising from his not being acquainted with the habits to which it ministered. His observations on the bill of the avoset, on the structure of the sloth, and on the melancholy condition of the woodpecker (*picus*), are examples of this habit; upon the woodpecker he is quite pathetic, but, as in all such cases, he bestows his pity upon a very unworthy object.

He has been charged with infidelity: but this, like some others, is a charge easy to be made and hard to be disproved, though it must be admitted that his works afford ground for it. There is no doubt that his opinions drew down the censure of the Sorbonne, and in the 4th vol. of his 'Histoire Naturelle' will be found the letters of the Faculty of Theology and the answers. His moral character, we are compelled to add, was far from good, there being too much evidence in proof of his licentious habits and conversation to admit of doubt on the subject.

His works were numerous, and have obtained for him that fame which he is said to have so much desired. His translations of Hales's 'Vegetable Statics,' and of Newton's 'Fluxions,' both of which he prefaced with great ability, appear to have been undertaken with a view of improving his style as well as of advancing his knowledge. The Memoirs of the Royal Academy, of which he was so distinguished a member, contain many of his papers; but without entering into these and other compositions, we proceed to the notice of his *opus magnum*, the 'Histoire Naturelle.' Of the 4to. editions the first in 36 vols., printed at the royal press, appeared in 1749, and was in a course of publication down to 1788; another was published in 1774 and the following years, in 28 vols., but this is comparatively of less value, for though it contains the supplementary matter, Daubenton's Anatomy is cut out, and the plates are considered as worn and bad. Of the Supplement 6 vols. appeared in Buffon's life-time. The 7th was published in 1789, by Lacépède, after Buffon's death, and, in it, Lacépède expressed his deep regret for the loss.

In the department of the birds Buffon was assisted by M. Gueneau de Montbeillard, Baillon, and the Abbé Bexon. There are 5 vols. on minerals: a history of vegetables was also contemplated.

The magnificence of the 'Planches Enluminées' is well known to every collector.

The 'Histoire Naturelle' has been translated into Italian, Spanish, Dutch, German (twice with additions), and English.[*]

Voltaire, D'Alembert, and Condorcet were among the most severe critics of Buffon's hypotheses; but the first did not add to his fame by an attack which exhibited more point than learning, and the last pronounced his eulogy. (*L'Homme aux quarante écus*, chap. 6; and also *Dialogues d'Evhémère*, &c., vol. xxxv. ed. of Lequien.) His system of organic molecules, and his theory of generation, faded before the luminous observations of Haller, Spallanzani, and other experimental philosophers.

BUFFOON, a jester; the name is said to be derived from 'buffa,' a word of the corrupt latinity of the middle ages, synonymous with 'alapa,' *i. e.* a slap on the cheek. 'Buffe' and 'Buffet' in the old French, and Bofetada in Spanish, were used in the same sense. Mountebanks and clowns in the farces used frequently to swell their cheeks with wind and then give each other a slap which produced a noise, to the amusement of the spectators. Hence are derived the word Buffones in Latin, the French Bouffons, and the Italian Buffoni (Ducange). Buffare or sbuffare in Italian means to puff the wind through the mouth. The English word buffoon is now generally used in a contemptuous sense. The Italians have two distinct words, Buffo and Buffone. Buffo is a theatrical term: opera buffa, commedia buffa, is a burlesque play, in contradistinction to opera seria and commedia di carattere, or serious comedy. The buffo is one of the principal characters in those plays corresponding to the English clown; in an opera there are often two, primo buffo and secondo buffo. Buffone in Italian means a funny ludicrous fellow, but not always in a contemptuous sense. Bouffon in French and buffoon in English have been occasionally used as synonymous with king's fool, a well-known character at courts in former times.

BUFO. [FROG.]

BUG, one of a numerous tribe of insects which constitute the order Hemiptera, belonging to the family Cimicidæ (*Leach*), and genus Cimex, under which head the structure of the common bug together with its generic characters is given: at present we will confine ourselves to a brief account of the habits of this insect.

It has been said that the bed bug was not known in England previous to the great fire of London in 1666, and that it was first imported from America in the timber brought over to rebuild that city; of the accuracy of this statement however there is considerable doubt. It appears to have been well known in various parts of Europe long before that time. Its shape, colour, and the offensive smell which it emits when touched, together with the circumstance of its deriving its nutriment from blood sucked through a long pointed proboscis, which when not in use lies parallel with the underside of the body, are all circumstances too well known to need comment. The female bug deposits her eggs in the beginning of summer; they are of a tolerable size compared with that of the insect, of a whitish colour, and each fixed to a small hair-like stalk, which, when the egg is first deposited, is apparently of a glutinous nature, and readily adheres to anything which it touches. The places generally chosen to deposit the eggs in are the crevices of bedsteads and other furniture, or the walls of a room. In about three weeks it is said these eggs hatch, and the young bug comes forth—an active larva, very closely resembling the parent insect except in size.[†] The larva then undergoes the usual transformation, and becomes a perfect insect in about three months.

What was the natural [illegible]t of this insect, [illegible] differs from most of its trib[illegible]ng no wings, is diff[illegible] to say; the species of bug which come nearest to it in affinity are generally found under the bark of trees, a habitat which the flat form of our insect is well adapted for. Pigeons, swallows, &c., are said to be harassed by bugs as well as man.

Various means have been proposed for destroying these insects, but we would recommend cleanliness as the best.

BUG (river). [BOG.]

BUGEY, an Alpine district of France, inclosed on the S.E., S., and S.W. by the Rhône, which here forms a considerable bend; several maps, however, make it extend across the Rhône into Savoy. It is a mountainous country; the heights are crowned with wood, especially firs; the valleys afford pasturage to a great quantity of cattle, from whose milk the inh. make cheese, which furnishes them with an important article of trade. The other chief articles of trade are cattle, wood, nuts, and hemp. The little city of Belley was the capital of the district.

Bugey formerly was subject to the counts (afterwards dukes) of Savoy, by whom it was ceded to France by the treaty of Lyon, A.D. 1601.

BUILDING ACT. [BRICK, p. 410.]

BUILTH. [BRECON.]

BUITENZORG. [JAVA.]

BULAMA. [BISSAGOS.]

BULB, a bud, usually formed under ground, having very fleshy scales, and capable of separating from its parent plant. Occasionally it is produced upon the stem, as in some lilies. [BUD.]

BULBOUS PLANTS, or those which spring from a bulb, form so peculiar a class among the objects of the gardener's care, as to require a short notice.

Bulbous plants are usually found wild in light sandy soil, in sheltered places; they spring up in the wet season, grow rapidly, and flower beneath a steady sun, and by the time their seeds are ripe their leaves wither, and the bulbs fall into a state of rest, which lasts generally for half the year. When they first begin to grow, their young stems are nourished to a great degree by the inspissated sap contained in the fleshy scales of which all bulbs consist; by the time they have acquired vigour enough to attract a sufficiency of nutritive matter from the soil by aid of their roots, the bulbs are so much exhausted that their external scales never recover, but dry up and fall away, while their place is supplied by an addition of new scales to the centre of the bulb. In order to secure flowers, and a state of vigorous health for the succeeding year, it is necessary that the new scales should, during the growing season, be filled as completely with nutritive secretion or inspissated sap, as those were that first existed; and it is this to which the cultivator has especially to direct his attention. Now the only way to secure this result is to present the leaves during the whole time of their growth to the influence of solar light, because it is only by such agency that nutritive matter can be generated. If this is attended to, bulbous plants will go on growing and flowering and multiplying themselves from year to year, provided care is taken, firstly that the soil which actually surrounds the bulbs, which are extremely succulent, is not retentive of moisture; and secondly, that the roots when they are emitted should have access to an abundant store of food. These circumstances are attended to with great care by the Dutch, who possess an exclusive trade of some value in hyacinths, tulips, and similar plants, in consequence of their low sandy fields being naturally capable of satisfying the conditions above mentioned. This will be evident from the following account given of the bulb-grounds near Haarlem by a competent observer:—

Wherever the bulbs do well, he found the soil to be of the lightest description of sand, such as can be blown away by the wind, with the water standing under it not nearer the surface than 15 inches, nor farther below it than 2 feet 6 inches. This, it seems, is the level of the water in the adjoining canals and ditches; and it is owing mainly to the points of the fibres going down to this water that the plants are so fresh and vigorous, while the dry sand above prevents their bulbs from being rotted. As a proof of the exceeding lightness of the soil, immediately after putting in a crop in the spring season, the surface is raked, and generally thrown into beds; cow-dung mixed with water is then thrown from barrels wheeled along the alleys over the whole surface with a scoop, so as to cover it all with a thin crust, through which the finest seeds vegetate, and without which the entire surface would be blown away. The cow-dung is taken fresh from the cow house. (*Gardener's Magazine*, and Loudon's *Encyclopædia of Horticulture*.)

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[*] Sonnini's Histoire Naturelle, generale et particulière, accompagnée de notes, etc., published at Paris from 1798 to 1807, forms a complete course of Natural History, in 127 vols. 8vo., containing Buffon's works, and the labours of the most able naturalists of the time, who assisted the editor in their several departments.

[†] The structure of the antennæ and some other parts, however, differ from those of the perfect insect.

That with many bulbous plants the gardeners of this country have little or no success is obviously owing to one of the following causes. They do not expose the plants when growing to a sufficient quantity of light, keeping them in badly lighted greenhouses or frames, or in the windows of dwelling-houses; or if they do expose them freely to light, they do not protect them with sufficient care from the effects of nightly frosts, by which the leaves become injured and unhealthy. Thus Guernsey lilies (*Nerine sarniensis*) seldom flower in our gardens the second year, although they may have blossomed finely the first year of their importation. The reason is, that the first flowers exhaust the bulbs, and the leaves appear so late in the season, that between the short and gloomy days of autumn and the ill-lighted greenhouses in which such plants are kept, they are unable to prepare a supply of food sufficient to replace that which the first year's flowers consumed, and consequently flowers in the second year are either not formed at all, or if formed, cannot be developed. Mr Knight put these principles to the test by stimulating Guernsey lilies into vegetation sufficiently early for their leaves to enjoy the full influence of the summer's sun; and he found that bulbs so treated flowered as well the second as the first year. Another cause is our not attending enough to the nature of the soil in which bulbs are grown. It should be always remembered that their scales are not only succulent, but very abundant, and that if the soil is retentive of moisture, they will not only become gorged with fluid, and consequently unhealthy, but the nutritive matter which they contain will be so much thinned as to be less fit for the food of the young leaves. This is doubtless the reason why the Dutch are so careful to select the lightest soil they can find, and, for the fluid necessary to support the growing plants, they trust to the watery stratum which is found some distance, from 9 inches to 2 feet, below the station of the bulbs themselves.

As bulbs are very much cultivated in this country in glasses of water for the ornament of sitting-rooms, the manner in which they can be most successfully treated under such circumstances deserves a brief notice. It has been already stated that if bulbs are placed in contact with water they are liable to rot; it is consequently desirable that the water into which they are to extend should be at least an inch below their base. To enable them to bear their leaves and flowers with vigour they should be abundantly furnished with roots, and these should have been secured for some short time before the stems and leaves are allowed to grow. But as the leaves are easily excited by light and warmth it will frequently happen when bulbs are placed in water-glasses in sitting-rooms, that their leaves are formed before the roots, and that the flowering is consequently weak and imperfect. To prevent this, it is desirable always to commence the forcing of bulbs by placing them in a damp closet or cellar where there is just warmth enough to excite them into growth; in such a situation the roots will strike out freely, but the leaves will remain at rest. After the roots are sufficiently formed, the glasses may be gradually removed into the light, and the leaves and flowering stem will then be developed with great vigour. After this there is nothing to guard against except too much heat and too great an absence of light; the former will cause the leaves to grow too rapidly, and to become what is technically called *drawn*, unless a much larger quantity of direct solar light is permitted to act upon them than we can have the opportunity of procuring in the months when bulbs are forced. They should therefore be kept in a south window in a cool room, and never removed to the interior of the apartment until their flowers are ready to unfold.

We have only to add a word or two upon the propagation of bulbs. They generally multiply by forming *cloves* in the axils of their scales; such cloves or young bulbs are in reality buds, and one such must exist in a rudimentary state at the base of every scale [Buds]. But it is only in a few species that more than two or three develop; in the common garlic a larger number than usual is constantly produced. When the number naturally developed is small, the multiplication of a new variety would be very slow if left to the unassisted efforts of the parent plant; a little simple application of the principles of vegetable physiology shows however the manner of increasing the number of cloves. The principal reason why bulbs such as hyacinths, for instance, produce only two or three cloves is, that the powers of development inherent in the axillary buds cannot be called into action because of the exhaustion produced by the formation of a fine flowering stem; if this be prevented, that sap which would otherwise be consumed by the flowers is directed into the axillary buds, which then become cloves or young bulbs in much larger numbers than otherwise. Consequently the destruction of the flowering stem when quite young is the most effectual mode of forcing the bulb to produce young ones.

BULGA'RIA, a province of European Turkey, now included in the Ejalet of Rum-Ili. [Rum-Ili.]

BULI'MIA (*Βουλιμία*), canine appetite, insatiable desire for food. The statement of the quantities of food consumed by some persons labouring under this disease is scarcely credible, yet it rests on testimony the veracity of which there is no reason to question. In the third volume of the 'Medical and Physical Journal' an account is given, by Dr. Cochrane of Liverpool, of a man, placed under his own personal inspection, who, in one day, consumed, of raw cow's udder, 4 pounds, raw beef 10 pounds, candles 2 pounds, in all 16 pounds, besides 5 bottles of porter. M. Percy, a surgeon-in-chief to the French army, made a report to the National Institute of the case of a soldier who was in the constant habit of devouring enormous quantities of broken victuals, basket-ful of fruits, and even living animals; the details given of the quality as well as of the quantity of articles consumed by this man, without ever satisfying his ravenous appetite, are too disgusting to be related. Dr Copland gives an account of two cases of this disease, which occurred in his own practice in children, one seven years of age and the other nine. 'In both these, but in the younger especially, the quantity of food devoured was astonishing. Everything that could be laid hold of, even in its raw state, was seized upon most greedily. Besides other articles an uncooked rabbit, half a pound of candles, and some butter, were taken at one time. The mother stated that this little girl, who was apparently in good health otherwise, took more food, if she could possibly obtain it, than the rest of her family, consisting of six besides herself. In both this and the other case the digestion seemed to be good. A nauseous smell emanated from the bodies. These children, who were both very intelligent, complained of no other uneasiness than a constant gnawing or craving at the pit of the stomach, which was never altogether allayed, but which, shortly after a meal, impelled them irresistibly to devour everything that came in their way, however disgusting.'

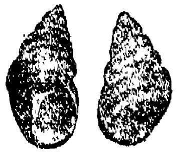
The real nature of the morbid condition of the stomach and of the system in this disease is very imperfectly known. In several cases the health in other respects has appeared good, but in most cases there has been evident disease in various organs, and death has usually taken place at an early age. On the examination of the body after death the stomach has commonly been found enormously distended and sometimes misplaced: the duodenum and the rest of the intestines are usually in the same state of distension; the coats of all these organs are commonly thickened, and the valvulæ conniventes (the folds of the inner or mucous membrane of the intestines) as large as in carnivorous animals. Various organic changes have at the same time been found in the mesentery and its glands, as well as in the liver, the pancreas and the spleen.

There can be no question that most cases of this disease might be greatly mitigated, if not wholly removed, by the firm and constant restriction of the food to that quantity only which the wants of the system really require. Unless the individual have strength of mind to submit to the necessary privation, or unless, in the case of children, a steady and undeviating restraint be imposed, every attempt to remedy the evil will be vain. If a rigid regulation of the diet be enforced, the cure will be materially assisted by a course of nauseating purgatives, as oil of turpentine rendered more active by castor oil. Several cases of great intensity have been completely cured by a steady treatment conducted on these principles.

When inordinate appetite is merely the result of some other unusual or morbid condition of the system, that is, when it is what is called symptomatic; when, as is often the case, it is the consequence of great fatigue, or of inanition, from long-continued acute disease, or of some malady attended with an extraordinary degree of secretion and ex cretion, and therefore with the removal from the system of a proportionate quantity of its nutrient matter, the disease can be cured only by the restoration of the system to its ordinary and sound state.

BULI'MULUS, Leach's name for a genus of terrestrial molluscs, which he thus defines:—Shell univalve, free, conically acuminated; spire elevated, regular; the last whorl very large; mouth entire, long; pillar smooth, simple; external lip thin; internal lip inflected towards the middle, with a hollow beneath. To this generic character the Rev. Lansdown Guilding observes that there should be the following addition: 'Tentacula 4, the two upper ones long with terminal eyes: no operculum.' The last named author observes that it differs from Bulimus in the delicacy of its outer lip. It is indeed a *Bulimus* of Lamarck. [BULIMUS.]

Leach observes that *Bulimulus trifasciatus* (*Bulimus Guadalupensis*, Brug.), a very common existing West Indian species, occurs imbedded in the same limestone which incloses the fossil human skeleton from the *Grande Terre* of Guadaloupe, now in the British Museum. 'Several skeletons of men,' says Lyell (in the 3rd vol. of his 'Principles of Geology,' p. 190, last edit.) 'more or less mutilated, have been found in the West Indies, on the north-west coast of the main land of Guadaloupe, in a kind of rock which is known to be forming daily, and which consists of minute fragments of shells and corals, incrusted with a calcareous cement resembling travertin, by which also the different grains are bound together. The lens shows that some of the fragments of coral composing this stone still retain the same red colour which is seen in the reefs of living coral which surround the island. The shells belong to the neighbouring sea, intermixed with some terrestrial kinds, which now live on the island, and among them is Bulimus Guadalupensis.' There is another human skeleton from the same rock in the Museum at Paris. Mr. König has published an interesting paper on the skeleton in the British Museum in the 'Philosophical Transactions.'



(Bulimulus trifasciatus*.)

BULI'NUS or **BULI'MUS**, the name of a very extensive genus of terrestrial pulmoniferous molluscs. Lamarck arranges it under his *Colimacea*, a family of phytophagous or plant-eating trachelipods, respiring air by means of lungs, and protected by a spiral shell which is more or less elongated, oval, oblong, or turriculated, with an entire aperture longer than it is wide, and with a very unequal border, which is reflected in the adult. The columella is smooth, without any notch or truncation at the base, but with an inflexion in the middle at its point of junction with that part of the peristome which it contributes to form. De Blainville places it under the *Limacinea*, his third family of Pulmobranchiata, whose organs of respiration are retiform, and line the cavity situated obliquely from left to right upon the origin of the back of the animal, communicating with the ambient air by means of a small rounded orifice in the right side of the border of the mantle. Some of the species were placed by Linnæus under his genera Bulla and Helix. Scopoli and Bruguières began the reform, and Lamarck carried it still further. But before we proceed, it may be necessary to say a word as to the origin of the term used to designate the genus. 'We constantly hear,' says Broderip, in the 4th volume of the Zoological Journal, 'among conchologists the question, what is the meaning of Bulimus?' The author of the article entitled Lamarck's Genera of Shells, in the 15th volume of the Journal of Science, thus derives the word 'βούλιμος, *insatiable hunger*—what title this genus has to so strange a name we know not.' It may not then be unacceptable to give a plain statement of the origin of the word. Swainson observes (*Zool. Illust.*, vol. i, *Bulimus Melastomus*) that 'the genus Bulimus was long ago formed by Scopoli, out of the heterogeneous mixture of shells thrown together in the Linnæan genus Helix.' Let us now turn to Scopoli's account of the source whence he derived the name. 'Proprium,' says Scopoli, 'itaque ex his constituo et duce celeberrimo Adansonio Buli*n*os voco, ut eo facilius adgnoscantur. Solam testam nec animal inhabitans vidi, quod diversum esse à Limaceo affirmat Adansonius.' (*Deliciæ*, &c., p. 67.) Now Adanson has no such genus as Buli*m*us, but he has such a genus as Buli*n*us. At plate 1, fig. G 2, in his Natural History of Senegal, will be found 'Le Bulin, Bulinus;' but the letters 'n' and 'u' are so confusedly engraven, that, at first sight, the word looks like Buli*m*us. In the text (p. 5), the word is printed Buli*n*us very plainly; but neither Scopoli nor any of his successors appear to have noticed it. Till the time of Lamarck, who confined the genus (still calling it Buli*m*us, after Scopoli and Bruguières) to the land-shells with a reflected lip, which now range under it, many land and fresh-water shells which have not a reflected lip, such as *Achatinæ*, *Physæ*, *Limnææ*, and *Succineæ*, were also congregated under the name of Buli*m*us. The Bulinus of Adanson was a fresh-water shell, apparently a Physa or Limnæa.'

The shell is never orbicular, as in the *Helices*, but of the shape noticed at the commencement of the article; the last whorl is always larger than the penultimate, and, indeed, as a general rule, may be stated to be larger than all the others put together. The mouth or opening is an oval oblong, and the border is disunited. The adult reflected lip or border on the right side is generally very thick, but this reflection is sometimes absent. The animal is very like that of Helix: De Blainville says entirely so (*tout à fait semblable*). The head is furnished with four tentacula or horns, the two largest of which are terminated by the so-called eyes. There is no true operculum. The geographical distribution of the genus is very general, and there is scarcely a part of the world where the form does not occur. The great development of it takes place in the warmer climates, where some of the species are very large.

The reproduction is by means of eggs, which are white and have a firm shell like those of birds: some of these eggs are of considerable size. The Bulimi are androgynous, true hermaphrodites (*Paracephalophora monoica* of De Blainville), both the sexual organs being distinct, but existing in the same individual, and requiring the union of two for the continuation of the species. Three eggs were laid by one of the species, *Bulimus ovalis*, from Rio in a hot house in the garden of the Horticultural Society at Chiswick. It was brought over in October, 1828, by Mr. William M'Culloch, then gardener to the Right Hon. Robert Gordon, and presented by him to the Society. At first it appeared rather sickly, but after it had been kept in the hot house for some time, it recovered and began to move about. Mr. Booth, who was on the spot, says, 'It cannot now be correctly ascertained when it produced the first egg, but it was very shortly after its arrival, I should think about the beginning of November. This egg was sent, by the desire of Mr Sabine, to the Zoological Society. About the same time this year (1829), it produced a second egg, and, three weeks afterwards, a third; the latter was unfortunately broken by the animal itself, but the former is still in preservation. It fed upon lettuces and the tender leaves of cabbages: the former seemed to be its favourite food. Sometimes it would devour two large lettuces, and then remain for days afterwards without touching food or moving from its place, except when cold water was sprinkled upon it. During the day it was usually in a dormant state in the shade; but towards the evening, when the house was moist and warm, it would spread itself out, and move from one part to another. It seemed to like moisture, and I have no doubt that it might have been preserved for years, if it had not been accidentally killed. On Saturday last it was at the end of the house where the fire comes in, and ventured too far upon the hot bricks after they had been watered. In the morning it was found fixed to them and quite dead.'* *Bulimus ovalis*, though it a good deal resembles *Bulimus hæmastoma*, which is here figured, is considerably larger.

The species are multitudinous. Mr. Cuming lately brought home numbers of new ones from South America, and we are indebted to that gentleman, who has just departed on another voyage which has for its object the collection of subjects of natural history, for the following account of the habits of *Bulinus rosaceus*. In the dry season he always found the animals adhering to the under side of stones, generally among bushes, and close at the edge of the sea-shore, within reach of the spray at times. On the hills, about 1000 feet above the sea, they were observed adnering between the lower leaves of an aloe-like plant, on the honey of whose flowers the giant humming-bird (*Trochilus Gigas*) feeds. The natives burn down clumps of these plants for the sake of the rings at the bottom of the footstalks of the leaves, which they use for buoys for their fishing nets and for baking the coarse earthenware which they make on the hills, because this part of the plant, when ignited, throws out a great heat. Between these leaves the Bulimi lie, in the dry season, in a torpid state. In the spring (the months of September and October), they burrow in the shady places at the roots of this plant, and among the bushes on the sea-shore. At this period (the spring), they lay their eggs in the earth, about two inches below the surface. Mr. Cuming never saw them crawling about. In the dry season they were evidently hybernating, for their parchment-like secretion, which operates in place of an operculum to seal up the animal, was strongly formed, and they stuck to the stones so tenaciously that Mr. Cuming broke many of them in endeavouring to pull them off. Chili and the neighbouring coasts of South America generally were the localities where the species was taken. Captain Phillip Parker King, R.N., who described the species in the Zoological Journal,* has the following notice of the power of the animal to exist in a dormant state:—' Soon after the return of the expedition (his Majesty's ships Adventure and Beagle,—*Survey*, 1826—30), my friend Mr. Broderip, to whose inspection Lieutenant Graves had submitted his collection, observing symptoms of life in some of

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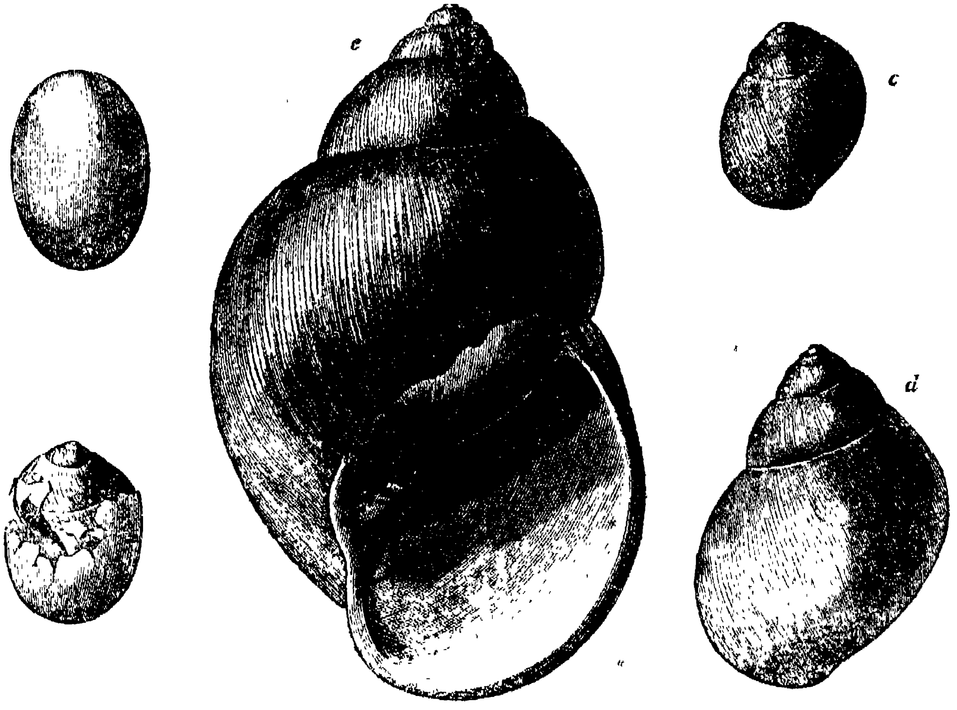
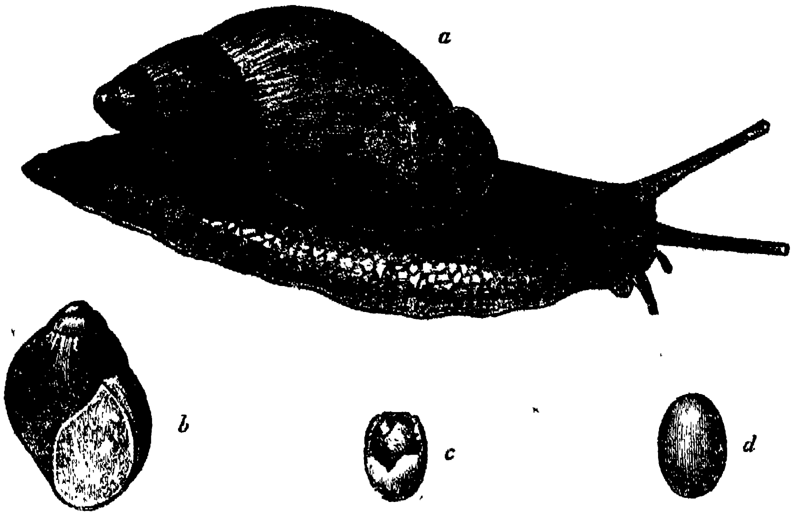
* The shell varies much in colour.

* Zoological Journal, vol v. p 102.



[Bulinus Hæmastoma, nat. size.]

a, the egg; *b*, the egg-shell broken, showing the young animal with its shell in situ; *c*, the shell of a young one just after exclusion from the egg; *d*, the shell at a more advanced age, but before the lip is reflected; *e*, the adult shell. The specimens figured were brought from Trinidad. It is found in the brakes of St Vincent's and of the Antilles generally.† The young shell is semitransparent, but becomes opaque as it advances in age. The adult shell is brown, strongly striated or wrinkled longitudinally, with a rose-coloured mouth. Epidermis brown.



[Bulinus rosaceus, nat. size.]

a, an adult, with the animal as it is seen when in motion; *b*, a young shell before the lip is reflected. The mouth is represented as sealed with the parchment-like secretion, which serves as an operculum when the animal is hybernating. c, egg-shell broken, discovering the infant shell; *d*, egg unbroken. Figure *a* was taken from one of the specimens mentioned above when living in this country. Adult shell roughish; apex and upper whorls of a rose colour in fine specimens; the other whorls brownish, mottled longitudinally in fine specimens with dirty white. Suture crenulated; lip white; throat brownish; epidermis greenish.

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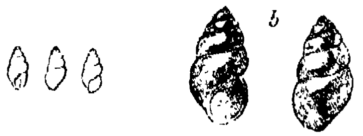
* Vol. v. p. 342.

† The Rev. Lansdown Guilding adds Æquinoctial America.

the shells of this species, took means for reviving the inhabitants from their dormant state, and succeeded. After they had protruded their bodies, they were placed upon some green leaves (cabbage), which they fastened upon and ate greedily. These animals had been in this state for seventeen or eighteen months; and five months subsequently another was found alive in my collection, so that the last has been nearly two years dormant. These shells were sent to Mr. Loddiges's nursery, where they lived for eight months in the palm house, when they unfortunately died within a few days of each other. Soon after the shells were first deposited at Mr. Loddiges's, one got away and escaped detection for several months, until it was at last discovered in a state of hybernation: it was removed to the place where the others were kept, when it died also. The upper surface of the animal, when in health, is variegated with ruddy spots and streaks on an ash-coloured ground.' The only process used for revivifying these animals was placing them on a plate near a moderate fire, and sprinkling them with tepid water. Upon their restoration, they ate a considerable part of the parchment-like seal or operculum. They lived some time with Mr. Broderip before they were sent to Messrs. Loddiges. These animals had been packed up in a box and enveloped in cotton from the time of their capture to the period mentioned, when they were unpacked by Mr. Broderip. Lyell notices this circumstance when treating on the geographical distribution of testacea, in the third volume of his Principles of Geology.*



[Bulinus lubricus.]

[illegible] b, magnified. Inhabits Northern Europe, an[illegible] mon in the neighbourhood of Paris. Shell smooth, shining, of a horn colour, inclining to fulvous, transparent.

Fossil Bulini.

Deshayes, in his tables (see Lyell's *Principles of Geology*, vol. iii. Appendix I. pp. 18 and 19; N.B. these tables are not printed in the last edition), enumerates three fossil species of Bulini in the tertiary formation, one of which is known to him from the sub-Apennine beds, and another from Paris, but he does not give the locality of the third, nor does he identify any of the fossils with recent species. De la Beche, in his geological manual, under the head of Fossil Shells, contained in the supracretaceous rocks of Bordeaux and Dax, enumerated by M. de Basterot, has the following notice: 'Bulimus? terebellatus, Lam., analogous to the existing species, Grignon, Placentine, Dax.' Lamarck (*Animaux sans Vertèbres*, vol. vii. p. 534) describes the shell of *Bulimus terebellatus*, a Grignon fossil, as two centimeters in length, and observes on the singularity of its mouth or opening, but he makes no allusion to its resemblance to any existing *species*. In the 'Annales du Muséum,' he places it among the *Bulimi* with doubt, observing that it may, from its conformation, be probably marine, but keeping that generic name for it, because it approaches nearer to the Bulimi than to any other known genus. In the seventh volume of his *Animaux sans Vertèbres*, published eighteen years afterwards, he still arranges it among the *Bulimi*, and not under the head of 'doubtful species.' The fifteen species described by Lamarck in this volume are all stated to be fossil, and only the five last are separated as *Espèces douteuses*. Of the not doubtful species, *Bulimus sextonus*, found fossil at Villiers and Grignon, bears a great resemblance, according to the author, to *Bulinus lubricus*; but he observes that the opening or mouth of the fossil shell is much shorter than that of the recent, and that the summit of its spire is less obtuse. It may be doubted whether even the ten first fossil species enumerated by Lamarck are all true *Bulini*. De Blainville quotes Defrance for thirty-seven fossil species.† [Helix.]

BULL. [Ox.]

BULL, GEORGE, was born in the city of Wells, on the 25th of March, 1634: he received the first part of his education at the grammar-school of Wells, from which he was removed to the free school of Tiverton, in Devonshire, then superintended by Mr. Samuel Butler, who is reported to have had an excellent method of teaching. At fourteen he was admitted a commoner of Exeter College, Oxford; but, in the following year, on refusal to swear to the engagement, 'That he would be true and faithful to the Commonwealth of England, as it was then established without a King, or House of Lords,' he retired, with his tutor, Mr. Ackland, and several others, to North Cadbury, in Somersetshire, where he prosecuted his studies until his nineteenth year. By persuasion of his friends he now went to reside with Mr. William Thomas, a Presbyterian divine, from whom he derived little or no assistance in the study of divinity. This residence however brought him into intimate acquaintance with Mr. Thomas's son, who directed his reading, and supplied him with the writings of Hooker, Hammond, Taylor, &c. Mr. Bull was irregularly ordained, at the age of 21, by Dr. Skinner, ejected bishop of Oxford, at a time when it was 'criminal for a Bishop to confer holy orders.' His professional duties commenced in the parish of St George, near Bristol. In 1658 he obtained the living of Suddington St. Mary near Bristol, where he became privy to an unsuccessful scheme of a general insurrection in favour of the exiled family, his house being one of the points of meeting. After the Restoration he was presented by Lord Chancellor Clarendon to the vicarage of Suddington St. Peter. These preferments he retained until 1685, having distinguished himself by his zeal, judgment, and charity, on all occasions. In 1669 he published, in Latin, his 'Harmonia Apostolica.' In the words of his biographer, Nelson, 'There having been, during the unhappy times of the great rebellion, a vast multitude of books written upon the subject of Justification, by the hot men of the several parties, some of whom in treating of it leaned too much to Popery or Judaism, others to Antinomianism and Liberalism, some again to Pelagianism and Socinianism, and others, lastly, to Manichæism and Fatalism, all very dangerous errors; and abundance of learned sophistry having been used in perplexing the plain and natural sense of the divinely inspired writers; and several hypotheses moreover invented purely to serve a turn, which did but the more still obscure what they pretended to clear up, and set at a wider distance those whom they laboured to reconcile by their strained and metaphysical subtleties; they not only disagreeing about what was meant by justification, but even by faith and by works, and indeed about every term that is made use of either by St. Paul or by St. James when they speak to this point: and so feigning one apostle to write concerning a first, and the other concerning a second justification, or else one concerning a justification before men only, and the other concerning the same before God; one concerning a true, the other concerning a false faith, with a multitude of other groundless inventions, utterly foreign to the minds of both the said apostles; and many foolish contests having been started about words, that could have no other end but to raise a dust, there could nothing come forth more seasonably, if well done, than a treatise of this nature.' The object of this book, which consists of two parts, or dissertations, was to explain and defend, first, the doctrine of St. James, and, in the second, to demonstrate the agreement with him of St. Paul; it being more particularly his aim, in the first dissertation, to show, 'That good works, which proceed from faith, and are conjoined with faith, are a necessary condition required from us by God, to the end that by the New Evangelical Covenant, obtained by and sealed in the blood of Christ, the mediator of it, we may be justified according to his free and unmerited grace.' In the second, 'having in the first place established this one point for his foundation—*That St. Paul is to be interpreted by St. James, and not St. James by St. Paul*, in consent with many of the antients, (and particularly of St. Augustine himself,) who are of the opinion that the General Epistle of St. James, the first of St. John, and the second of St. Peter, with that of St. Jude, were written, against those who, by misinterpreting St. Paul's Epistles, had imbibed a fond notion, as if faith *without works* were sufficient to save them; he sheweth whence this obscurity and ambiguity in the terms of St. Paul might probably arise, which was the occasion that persons not well-grounded came to mistake or pervert the same.' Bull proves, that, where St. Paul speaks of justification by faith, he intends the whole condition of the Gospel-covenant; that the faith required implies obedience: that it cannot be separated from obedience; and that obedience is made necessary to justification. The publication raised much dispute among divines. The first open antagonist was Mr. John Truman, a Non-conformist minister. Dr. Morley, bishop of Winchester, and Dr. Barker, the one from the divinity chair at Oxford, and the other, in a charge to his clergy, forbade the reading of the book, as a rash intrusion into things too high for such discussion. Though, for a while, much prejudice was excited against our author, yet, when he published his answer entitled 'Examen Censuræ,' and his 'Apologia,' his reputation increased, and the soundness of his view was generally acknowledged. In testimony of his merit in this particular instance, Lord Chancellor Finch presented him to a prebend in the church of Gloucester. In 1685 he published his 'Confessio Fidei Nicenæ,' a work directed against the Arians and Socinians, and Sabellians and Tritheïsts, by which he gained great celebrity both at home and abroad. In the same year in which he was preferred in Gloucester Cathedral, 1678, he received the rectory of Avening in Gloucestershire, from Philip Shepherd, Esq.; and in the next year he was installed archdeacon of Llandaff, on the nomination of archbishop Sancroft, and about the same time was complimented with the degree of doctor of divinity by the University of Oxford, for the service he had rendered the church in his 'Defensio Fidei Nicenæ.' In 1694 he published his 'Judicium Ecclesiæ Catholicæ,' in vindication of the Anathema, as in his 'Defensio' he had vindicated the faith established at the council of Nice, against Episcopius. For this publication the thanks of the whole clergy of France were transmitted to him through Bossuet, bishop of Meaux. His last work, published before his death, was his 'Primitive and Apostolical Tradition, &c.' in which he proved, against Daniel Zucker, that the pre-existence and divine nature of our Lord was an apostolical doctrine. In 1701 he was nominated to the bishopric of St. David's, a promotion which he at first declined, alleging his years and infirmities; but at length he gave a reluctant consent, and was consecrated at Lambeth on the 29th of April, 1705. His conduct as a bishop, as well in the House of Lords as in his diocese, was such as to justify a belief that, had he been earlier advanced to that dignity, he would have been of signal use. Close application to study had impaired his health, and he expired on the 17th of February, 1709, and was buried at Brecknock. After his death his sermons were published by his only surviving son, in compliance with his directions. Perhaps no sermons have more of a primitive character than those of Bishop Bull; none more clearly discriminate between primitive doctrine and modern error. Their great 'aim is to infuse into the hearts of Christians right apprehensions of the doctrines of Christianity, and therefore he deduceth them from Scripture, and the purest ages of the church; and at the same time endeavours to make such an impression upon their minds that they might pursue their duty with some warmth, which he doth with so much more authority by how much it appeareth that he was affected himself with what he delivered to others. Several tracts which it is said cost him much labour, were lost by his own neglect. His works, with a copious account of his life and writings, were published by Robert Nelson, Esq. His Latin works were collected, during his lifetime, into one volume folio, by Dr. Grabe. (Nelson, and *Biographia Britannica.*)

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* Vol. iii. p. 6, last edit., 1834.

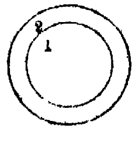
† For the subdivisions *according to the form of the shell*, see De Ferussac's great work (*Cochlogena, &c.*). De Blainville, in his 'Additions and Corrections,' quotes the genus *Balea* of Prideaux and Gray for one of his divisions of *Bulimus* (the reversed or left-handed species with the opening pointed at the two extremities) and gives *Bulinus citrinus* as an example; but the type of the genus *Balea* is *Pupa fragilis* of Draparnaud.

BULL-DOG. [Dog.]

BULL-FIGHTS, a very antient and barbarous amusement, which, under different modifications, has descended to modern times, and is found in many of the countries of Europe, though the English form of it (bull-baiting) may almost be said to have gone out of fashion.

Bull-fights were known to the antient Egyptians; and also to the Greeks more than 300 years before Christ. The Thessalians had their regular festivals or days of bull-fighting. As the Thessalians were celebrated for their skill in horsemanship, it is probable their combats resembled those of the Spaniards, the most celebrated of modern bull-fighters, and the only European people that have preserved the sport in its perfection. The bull-fight, as we understand it, was not included in the games of the Roman amphitheatres. It appears to have been common among the Moors, who are generally said to have introduced it with the djerid and other equestrian and warlike sports into Spain in the eighth century. Though disgusting from the quantity of blood of bulls, horses, and men that frequently flows in the arena, a true Spanish bull-fight, like those exhibited at Madrid, Seville, Cadiz, and the great cities of the south, is a gallant and imposing spectacle. It has often been described in prose and verse. In the first canto of Lord Byron's Childe Harold, there is a description of one at Cadiz, which is not more poetical than it is correct. A few words in plain prose may convey some notion of the game, to which Spaniards of both sexes and of all ranks are passionately attached.

The amphitheatre, or plaza de toros, in the great cities, is an extensive edifice partly built of stone and partly of wood it is open at top, with seats running round it and rising above each other, and is capable of accommodating from 5000 to 10,000 spectators. The lower tier of seats is protected by a parapet, in front of which a very strong wooden fence, about 6 feet high, is erected; this fence runs (like the seats) all round the arena, at the distance of from 12 to 20 feet from the lowest tier of seats. The ground-plan of the plaza thus describes two circles, No. 1, or the inner circle, being the battle-ground, and No. 2, or the outer circle, being the place where the men on foot take shelter when hard pressed by the bull. To allow of the latter movement, openings just large enough to admit a man sideways are made in the strong fence which separates the two circles.



The actors on the arena are, first, the bull, which ought to be of the fierce Andalusian breed; second, the picadores, or men who attack the bull on horseback; third, the banderilleros, who attend on the picadores, and are armed with sharp goads furnished with coloured streamers; fourth, the chulos, or men with glaring coloured cloaks, with which they distract the bull's attention; and fifth, the matador, who directs most of the movements, gives the bull his finishing stroke, and who, in reality, may be considered as the chief performer. Each matador, as well as each picador, has generally two chulos attached to his person. When all is ready, there is a flourish of trumpets; then the picadores with lances in rest caracole within the barricade, and the banderilleros and chulos, in their old Spanish and bespangled dresses, step lightly into the arena. The trumpets sound again—the combatants take up their places, and all is quiet in the amphitheatre. Another flourish, and the bolts of the bull-stall are withdrawn, the gate in the barrier is thrown open, and the spectators shout El toro! (the bull!) who, if he be a good one, gets into the midst of the arena at a single bound. The picadores await his furious onset, their object being to wound him with the lance, and then give him the go-by, avoiding the shock of his charge, which is sometimes fatal both to man and horse. Generally speaking, however, the Andalusian horses used for the sport are thoroughly well in hand, and on their haunches, turning most nimbly on their hind legs; and the men, by long practice, have such sure eyes and hands, and are altogether so adroit, that any serious misfortune is to be looked upon rather as an accident than as an ordinary result. When any picador is closely pressed, the footmen, both banderilleros and chulos, rush to his assistance, and, by pricking him with their darts, and waving their red, scarlet, and yellow scarfs before his eyes, nearly always succeed in drawing off the bull's attention. These attacks and defences are repeated until successive wounds from the lance and the shorter goads of the banderilleros cause the poor bull's flanks and shoulders to stream with blood. At first these wounds madden him, but the loss of blood and his furious exertions gradually weaken and dispirit him. In most approved bull-fights, at a certain stage, the picadores or horsemen withdraw, and leave the combat to the banderilleros, each of whom carries a banderilla or goad, about two feet long, ornamented with a pennant, in each of his hands, but no cloak or dazzling scarf of any kind on his arm. Thus armed, the banderillero runs up to the bull, and stopping short when he sees the animal's head lowered to attack him, he fixes the two shafts, without flinging them, behind the horns of the bull, at the very moment that it is preparing to toss him. The pain thus occasioned makes the bull throw back his head and lose his blow, on which the nimble-footed banderillero retreats, one of his comrades comes up to the charge, or a chulo throws a cloak over the bull's horns, and so, by blinding it, prevents the renewal of the combat for some seconds. Should the banderillero fail in fixing his darts, and should the bull be still fresh, he must rush to one of the openings left in the wooden fence, and creep into the outer circle. The nimblest of the banderilleros, instead of seeking the opening, which may be too distant for them to make in face of the bull's horns, will lay their hands on the top of the fence and spring over it; and a fine bull of the true breed has sometimes been known to go over after them, clearing the six-feet fence as an English hunter takes a five-bar gate.

At length, bellowings of rage and pain, and his wavering, uncertain onsets, show that the poor bull's death is near. Then a great man in the privileged government boxes waves his handkerchief, and another flourish of trumpets gives the signal to the matador to come forward and do his last office. Followed by some chulos as auxiliaries and assistants, the matador advances with a red mantle, or a piece of red cloth attached to a short handle, in his left hand, and a long well-proved sword in his right. He first of all drops on one knee in front of the royal or government box, doffs his cap, asks permission to finish the affair, draws his arm across his breast to the right and left, throws down his cap as a pledge that he must redeem, and then rises to do his work. The perfection of his performance consists in this—he must wait the bull's charge, his person being partially, and his toledo blade wholly, concealed behind the extended cloak, and he must so receive the bull on its point that the sword shall penetrate up to the hilt in that particular part of the animal where neck and shoulders meet. When this happens, the bull staggers for a second or two, and then drops in the midst of the enthusiastic shouts of men, women, and children. As soon as the bull is dead, and sometimes before, another blast of trumpets is heard, and four powerful and richly caparisoned mules, with large bells round their necks and harnessed a-breast, trot into the arena. Their traces are hooked to a cross bar, which is attached to the bull's horns; trumpets are sounded and hands clapped, and away gallop the mules, bull and all. The barriers are again closed, and the lists ready for another exhibition of torture and blood. (See a very graphic account in *Madrid in* 1835; see also Doblado's *Letters from Spain*, and Townsend's very accurate and lively *Travels in Spain*.)

BULL-FROG. [FROG.]

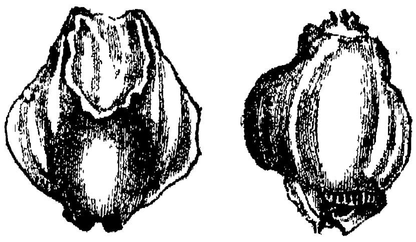
BULLACE, the English name of a kind of plum, the prunus insititia of botanists. It is probably a mere variety of the sloe.

BULLADÆ, a family of marine mollusks, which authors seem to agree in placing in the vicinity of *Aplysia* or *Laplysia*, as it is more generally but erroneously written. Thus Lamarck arranges it among his Gasteropods, between the Calyptracians on one side and the Laplysians on the other, making the family to consist of the three following genera, *Acera* or *Akera*, *Bullæa*, and *Bulla*. Cuvier finds a situation for it in his fourth order of Gasteropods, the Tectibranchians (Monopleurobranchians of De Blainville), which includes both Aplysia and Umbrella. De Blainville places it next but one to his Aplysians (his family *Patelloidea* intervening) under the family *Akera*, the fourth of his third order (*Monopleurobranchiata*), of his second subclass (*Paracephalophora Monoica*), of his second class (*Paracephalophora*.)

Lamarck's *Acera* and De Blainville's *Lobaria* are identical.

LOBARIA.

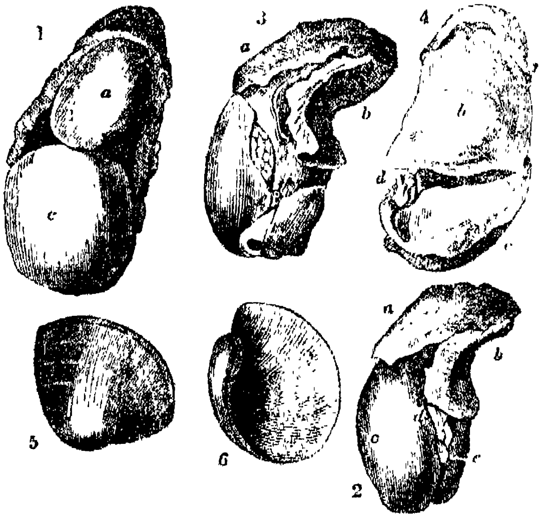
Body oval-oblong, subglobular, appearing to be divided into four parts: one anterior for the head and thorax, one on each side for the natatory appendages or fins, and one posterior for the viscera. The anterior fleshy disk terminates in an approach to a point near the middle of the body; the branchiæ covered by the mantle are so posterior that they seem to be almost at the extremity of the body, and below them would be the analogous situation for the shell, of which there is not even a rudimentary trace. *Acera carnosa*, Lam.; *Bulla carnosa*, Cuv.; *Lobaria carnosa*, Blainv., an European species, is the only example known; but De Blainville observes that it may perhaps approach the small incompletely known mollusk on which MM. Quoy and Gaimard have founded their genus *Triptère*, and which is figured in the atlas of the voyage of the Uranie. Rang considers this opinion to be erroneous, for he declares that the *Triptère* of Quoy and Gaimard evidently belongs to the genus *Cleodora*.



[Lobaria carnosa.]

BULLÆA.

Lamarck assigned this name to those of the family which have the shell entirely hidden in the substance of the mantle. This shell is very open and delicate, and can hardly be said to have more than the first rudiment of the rolled-up form which is in Bulla carried to greater perfection. *Bullæa aperta*, Lam. (*Bullæa Planciana*, Lam. in the early edition of the Syst. des Anim. sans Vert.) *Amygdala marina* (Amande de mer), Planc., *Bulla aperta*, Lin., *Bulla aperta* and *Lobaria quadriloba* of Gmelin, which is found in almost all seas, generally on sandy bottoms, will serve for an example. The animal is whitish, more than an inch in length, and, as Cuvier observes, the fleshy shield formed by the vestiges of the Tentacula, the lateral borders of the foot, and the mantle occupied by the shell, seem to divide it into four portions, whence Gmelin's term *quadriloba*. The shell is delicate, white, semitransparent, and consists almost entirely of aperture. The stomach or gizzard is armed with three very thick rhomboidal bones or rather shelly pieces.



[Bullæa aperta.]

Fig. 1, view of the back; 2, side view, the right; 3, the same, but the central fleshy plate separated from the dorsal to show the parts between, 4, view of the under side; *a*, the fleshy plate which covers the anterior part of the body; *b*, the fleshy plate that acts as a foot; *c*, the part which contains the shell; *d*, a part of the branchiæ; *e*, the vent; *f*, the common orifice of the testicle and oviduct; 5, shell in its natural position; 6, view of the under or concave side.

Bullæa has been found at a depth ranging from near the surface to 12 fathoms. Mr. W. Clark found three English species, two of them (*Bullæa catena* and *B. punctata*) at Exmouth and Torquay in pools at the time of the lowest spring tides; and a third (*Bullæa pruinosa*) by dredging off Budleigh Salterton. The depth is not mentioned, but it is probable that it was considerable, for the author says that it is rare, and only occasionally to be procured by deep dredging seven or eight miles from the shore. The first of Mr. Clark's species, which is *Bulla catena* of Montagu, had a testaceous gizzard, but the gizzards of the other two were unfurnished with shelly appendages. (See Mr. Clark's description, Zool. Journ. vol. iii. p. 337.) G. Sowerby, when speaking of the use of the shelly pieces and their powerful adductor muscles, states that the animal of *Bullæa aperta* is sometimes distorted by having swallowed entire a *corbula* *nucleus*, which is a very thick and strong shell, nearly equal in size to itself.

De Blainville says of this genus that he characterises it somewhat differently from Lamarck, who established it, and who only places under it the *Acères* (Acerata), whose shell is internal; but as De Blainville considers the animal to be of the first consequence, he distinguishes under the name of *Bullæa* those species which, whether their shell be external or internal, have the foot thickest and not dilated into natatory appendages, having, in fact, habits different from the *Bullæ*, according to his acceptation of the term, which swim very well and creep very badly. He divides *Bullæa* into

1st. Those species which have an internal shell very incompletely rolled up without spire or columella, and selects as his example *Bullæa aperta*, the species figured above.

2nd. Those species whose shell is internal and very incompletely rolled up, with a columella and alveolar spire (*spire rentrée*), and gives as an example *Bulla ampulla.*

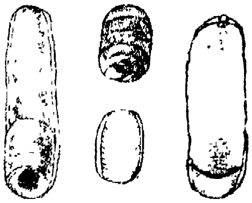
3rd. Species whose shell is internal, the lateral lobes cirrhous and more developed, and gives as an example Ferussac's *Bullæa* (Quoy et Gaimard), here figured from the Atlas Zoologique of the voyage of the Uranie.

[Ferussac's Bullæa.]

In the 'Additions and Corrections' to his Malacologie, De Blainville says that, in studying more attentively the species of these two genera, it seems to him that the greater part would be better placed under *Bulla* than under *Bullæa*, where he would leave only the species which serves for the type, and another lately brought from the seas of New Holland by Quoy and Gaimard. He then proposes an entirely new arrangement into seven groups represented by the following genera: 1. *Bullina* (*Bulline*) of Ferussac, with a projecting spire (example *Bulla Lajonkairiana*, Bast.) 2. *Aplustre* (Schum.) 3. *Bulla.* 4. *Atys.* (Montf.) 5. The form represented by *Bulla fragilis.* 6. *Scaphander* (Montf.), which is *Bulla lignaria.* 7. *Bullæa* (Lam.).

SORMETUS.

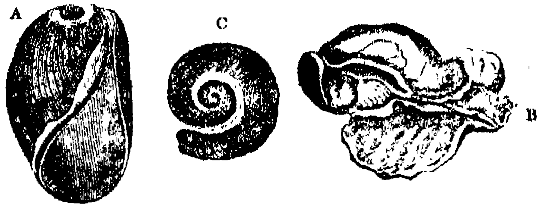
Cuvier observes that this form approaches very closely to that of his Bullææ, but he adds that he does not find sufficient certainty in the imperfect materials afforded by Adanson, to enable him to found either a genus or even a species on them. De Blainville places it as a genus next to Lobaria, but his description and figure are taken from Adanson, and he is obliged to add that it is established upon an animal 'assez incomplètement connu.' We give Adanson's figure, but we do not think any satisfactory inference can be drawn from it as to the position which *Sormetus* should hold among the testaceous mollusca.



[Sormetus Adansonii.]

BULLA.

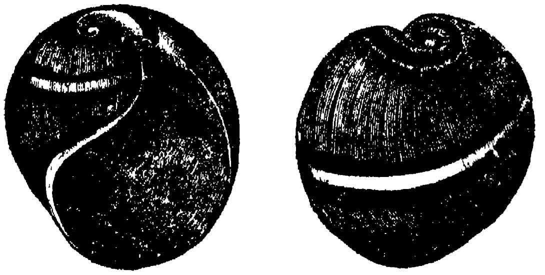
Besides the true Bulladæ, the heterogeneous *Bulla* of Linnæus comprised some of the *Physæ* and *Achatinæ*, and of the *Ovula*, *Terebella*, *Pyrulæ*, &c.: in short, the genus comprised animals of entirely different organization: terrestrial and marine testacea—the former breathing air and the latter respiring water—were there placed side by side. Lamarck retains the name (and Cuvier seems to adopt his arrangement) for the species whose shell covered by a slight epidermis is sufficiently large to afford a retreat to the animal, and is more perfectly rolled up than the shell of *Bullæa*. Lamarck describes the shell of his *Bulla* as completely rolled up (enroulée), showing itself constantly uncovered. It is, generally speaking, only partially enveloped by the animal, which can retreat into it almost entirely, has no distinct columella nor any true spire, unless indeed that term be applicable to the apex of *Bulla fragilis*, which we now proceed to describe. Its shell is ovate-oblong, very thin and fragile, of a horn colour, with very small transverse striæ, and the apex rises into the rudiment of a projecting spire.



[Bulla fragilis.]

A, the shell showing the aperture. C, a view of the spiral end, showing the way in which the shell is rolled up. B, the animal

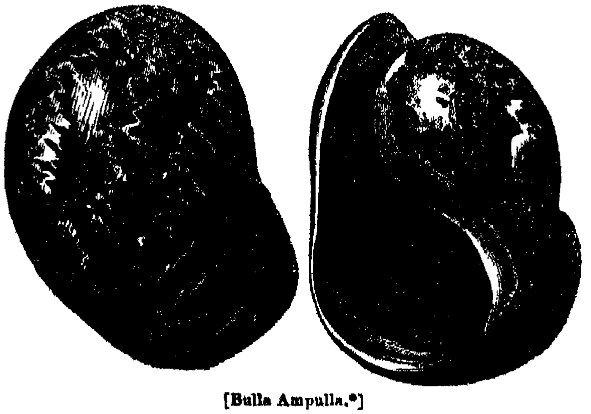
Lamarck says that it inhabits the English channel (La Manche), near Nantes and Noirmoutiers. We now proceed to give an example of those species which while they have a little more solidity than *Bulla fragilis* are still very delicate and fragile in their texture.



[Bulla Velum]

The shell is very delicate, of a very light horn-colour when in fine condition, with a snow-white band about the middle, bordered on each side with a broad dark-brown one; the apex and base are white, both bordered with dark-brown bands. There has been some confusion about this shell. Lamarck refers to the figure of it for his or rather Bruguières' *Bulla fasciata*, but we do not see why Gmelin's name should be changed. Born figures it as *B. amplustre* of the Systema Naturæ, which is a different shell, and is described by Linnæus as having red bands. *Bulla velum* is said to be Oriental.

As an example of the more solid *Bullæ*, we take the well-known species *Bulla ampulla.* The shell is ovate and subglobose, beautifully mottled with white, plum-colour, and reddish. Instead of a spire there is an umbilical alveolus. Lamarck gives as a locality both the Indian and American oceans; Deshayes, the European ocean and the Indies. The fine specimens which we have seen were stated to have been Oriental.



[Bulla Ampulla.*]

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* From an oversight of the draftsman in not using a mirror, the shell is made to appear reversed, or left-handed, as the collectors say.

Among the solid Bullæ we must mention the common *Bulla lignaria* of our coasts, with its testaceous stomach or gizzard, so well known as the vehicle of Gioëni's half error, half fraud. He found these testaceous gizzards and elevated them immediately to the rank of shells *sui generis* literally, for he gave the genus his own name and imposed upon many: he went so far as to describe the habits of his pretended testaceous animal. Draparnaud first exposed this piece of *charlatanrie*.

Bulla has been hitherto found at nearly the same depths and on nearly the same bottoms with *Bullæa*.

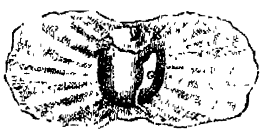
FOSSIL BULLADÆ.

Lamarck enumerates four fossil species, all of them from Grignon: G. Sowerby says that such are only to be distinguished in the tertiary beds and in the green sand. Deshayes in his tables,* speaking of tertiary fossils only, gives two fossil species of *Bullæa*, one from the sub-Apennine beds, and one from Paris. Of *Bulla* he enumerates 23 fossil in the tertiary beds; and of these, two are both living and fossil, viz. *Bulla lignaria* and *B. ampulla*. The first he places in Sicily, in the sub Apennine beds (Italy), and the English crag at Bordeaux and Dax, in Touraine, at Turin, Angers, Paris, and Valognes: in short, in the beds of the Pliocene, Miocene, and Eocene periods of Lyell. The second Deshayes quotes as occurring in beds of the Pliocene period only, viz. those of Sicily and the sub-Apennine beds (Italy). In his edition of Lamarck (vol. vii., 1836,) he takes no notice of *B. ampulla* as a fossil, but notices *B. striata* (which he observes has been confounded with *B ampulla*) as a fossil species. He also remarks on the confusion between *B. solida* and *B. cylindrica*, and proposes that *B. solida* should take the name of *B. cylindrica*; that the *Bulla cylindrica* of Bruguières, living in the Mediterranean and European seas, should be called *B. cylindracea* (Pennant's name); and that the fossil *Bulla* from the environs of Paris, confounded with the latter, should be named *Bulla Bruguièrei*.†

De Blainville places the following Mollusks under his family of *Acères* (Acerata).

GASTEROPTERA,

whose body is divided into two parts, the posterior being globular and joined by a peduncle to the anterior portion, which is small, but enlarged on each side into a considerable muscular expansion transversely oval, and cut or hollowed out in the middle, both above and below, rendering the expansion bilobated, as it were, and an organ for swimming, in place of a foot for creeping. The lateral gill is uncovered: there is no shell. Example, *Gasteroptera Meckeli*, from the Sicilian seas.



[Gasteroptera Meckeli.]

The genera *Atlas* and *Bellerophon* are also arranged by De Blainville under his *Acères*. [ATLANTA and BELLEROPHON.]

BULLETIN, a French word which has been adopted by the English to signify a short authentic account of some passing event, intended for the information of the public. Bulletin is derived from 'bulla,' a sealed dispatch. (Ducange, *Glossarium*.) When kings and other persons of high rank are dangerously ill, daily bulletins are issued by the physicians, relative to the state of the patient. In times of war, and after a great battle, bulletins are sometimes issued from the head-quarters of the victorious army, and are sent off to the capital to inform the people of the success. This practice became common with the French grand army under the immediate command of the Emperor Napoleon from the time of the campaign of Austerlitz in 1805 till his abdication in 1814. He issued a series of bulletins during each campaign, which were intended to give information to the people at home of the progress of his operations and the triumphs of his arms. They were written in a popular and somewhat inflated style, and at last fell into such disrepute with the Parisians, that they used to say of a man who lied largely, 'Il ment comme un bulletin.'

BULLEYN, ANN. [BOLEYN.]

BULLFINCH, or BULFINCH (in Latin *Pyrrhula*, in French *Bouvreuil*), the name of a genus of birds separated by Brisson from the Grosbeaks, afterwards again incorporated with them, and now by Temminck and others again arranged under Brisson's name *Pyrrhula*.

The following is Temminck's generic character:—

Bill short, hard, conico-convex, thick, swollen (bombé) on the sides, compressed at the point and towards the edge (arête) which advances upon the forehead; upper mandible always curved; lower mandible more or less so.

Nostrils basal, lateral, rounded, most frequently hidden by the plumage of the forehead.

Feet with the tarsus shorter than the middle toe; the front toes entirely divided.

Wings short, the three first quills graduated (étagées), the fourth longest.

Tail rather long, slightly rounded or squared.

The place generally assigned by ornithologists to the bullfinches, between the grosbeaks and the crossbills, appears to be their proper position. Their food consists principally of seeds and kernels; and though the smaller species confine themselves for the most part to grain or seeds which they open, rejecting the husk, some of the foreign species, as Temminck observes, have the bill excessively large and strong, and capable of fracturing the most ligneous seed cases. Cold and temperate climates, adds the author last quoted, appear to produce the greatest number of species. They are found in Europe and America. The North of Asia appears to be equally their cradle, but they have never yet been observed in New Holland, and but few have been noticed in Africa, while South America produces many. All the known species are subject to a double moult. The males and females differ, and can be easily distinguished in all stages of life. The young of the year differ but little from the old birds, and only till their autumnal moult.

EUROPEAN SPECIES.

We select as an example the common bullfinch, *Le Bouvreuil* and *Bouvreuil commun* of the French (Buff. and Temm.); *Pivoine* of the same nation, according to Belon; *Fringuello marino*, *Ciufolotto*, *Suffuleno*, *Monachino*, of the Italians: *Dom-pape* of the Danes and Norwegians, *Dom-herre* of the Fauna Suecica, *Blutfinck*, *Rothburstiger Gimpel*, and *Der Gimpel* of the Germans, *De Goudvink* of the Netherlanders, *Y Chwybanydd*, and *Rhawn goch* of the antient British, *Loxia Pyrrhula* of Linnæus, and *Pyrrhula vulgaris* of Brisson.

The native song of this common but pretty bird is very soft and simple, but so low that it is almost inaudible. Its call is a plaintive whistle, and when feeding it utters a low short twitter. It has however acquired great celebrity from the facility with which it learns to whistle musical airs, and from the retention of its memory when well educated and carefully attended to. 'Those which are to be taught,' says Bechstein, 'must be taken from the nest when the feathers of the tail begin to grow, and must be fed only on rape-seed soaked in water and mixed with white bread; eggs would kill them or make them blind. Their plumage is then of a dark ash-colour, with the wings and tail blackish brown. The males may be known at first by their reddish breast, so that when these only are wished to be reared they may be chosen in the nest, for the females are not so beautiful nor so easily taught, though they answer the purpose of call-birds as well as the male.' Mrs. Charlotte Smith however says (*Nat. Hist. of Birds*) she had a nest of bullfinches given her of which only one was reared: it was a hen, which she kept only because she had reared it, but the bird hung in the same room with a very fine Virginian nightingale, whose song she soon acquired, and went through the same notes in a lower and softer tone. 'Although the young,' continues Bechstein, 'do not warble before they can feed themselves, one need not wait for this to begin their instruction, for it will succeed better, if one may say so, when infused with their food; since experience proves that they learn those airs more quickly and remember them better which they have been taught just after eating. It has been observed several times that these birds, like the parrots, are never more attentive than during digestion. Nine months of regular and continued instruction are necessary before the bird acquires what amateurs call firmness; for if one ceases before this time, they murder the air by suppressing or displacing the different parts, and they often forget it entirely at their first moulting. In general it is a good thing to separate them from the other birds, even after they are perfect, because, owing to their great quickness in learning, they would spoil the air entirely by introducing wrong passages; they must be helped to continue the song when they stop, and the lesson must always be repeated whilst they are moulting, otherwise they will become mere chatterers, which would be doubly vexatious after having had much trouble in teaching them.' The translator adds to this that he does not recommend the employment of bird-organs for instruction, because they are rarely accurate, and their notes are harsh and discordant; for bullfinches repeat the sounds exactly as they hear them, whether harsh or false, according to the instrument used. 'The good and pure whistling of a man of taste,' he further observes, 'is far preferable; the bird repeats it in a soft, flute-like tone.' When one cannot whistle well, he recommends the use of a flageolet.

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* Lyell's 'Principles of Geology,' 8vo. edit., vol. iii. appendix 1.

† The specific names 'cylindrica' and 'cylindracea' are so nearly alike, that we fear there will still be confusion.

In corroboration of this, the Hon. Daines Barrington, in his interesting letter to Dr. Maty, then (1773) secretary of the Royal Society, detailing experiments and observations on the singing of birds, states that, though many of them are capable of whistling tunes with our more gross intervals, as is well known by the common instances of piping bullfinches and canary-birds, this arises from mere imitation of what they hear when taken early from the nest; for if the instrument from which they learn is out of tune, they as readily pipe the false as the true notes of the composition. And he adds, that as birds adhere so stedfastly to the same precise notes in the same passages, though they never trouble themselves about what is called *time* or harmony in music, it follows that a composition may be formed for two piping bullfinches, in two parts, so as to constitute true harmony, though either of the birds may happen to begin or stop when they please. He procured such a composition by Mr. Zeidler, which he sent with his letter, remarking that it need scarcely be observed that there cannot possibly be much variety in the part of the second bullfinch. Slaney, on the information of a friend, states that the bullfinches imported from Germany have been chiefly taught to sing by weavers whilst at work at their looms, which is said to account for the birds beginning to sing when the head of a person standing before him is moved backwards and forwards. A single air with a short prelude is generally as much as the bird can learn and remember: but Bechstein, who asserts this, allows that there are some of them which can whistle distinctly three different airs, without spoiling or confusing them in the least. In truth, as the same author observes, there are different degrees of capacity among the bullfinches as well as in other animals. One young bullfinch learns with ease and quickness, another with difficulty and slowly; the former will repeat without hesitation several parts of a song; the latter will hardly be able to whistle one after nine months' uninterrupted teaching. Those birds which learn with most difficulty are said to remember the songs, when once learnt, better and longer, and rarely forget them even when moulting. To these attractive qualities of the bullfinch must be added its obedience and capability of strong attachment, which it shows by a variety of little endearing actions; and it has been known even to repeat words with an accent and tone indicative of sensibility, if, as Bechstein observes, one could believe that it understood them. Of its attachment the following are instances:—Buffon asserts that tame bullfinches have been known to escape from the aviary, and live at liberty in the woods for a whole year, and then to recollect the beloved voice of the person who had reared them, returning, never more to leave her. Others, when forced to leave their master, are said to have died of grief. They well remember an injury. One of them having been thrown down, cage and all, by some low people, did not seem at first much disturbed by the fall, but afterwards, when it saw a shabbily-dressed person, it fell into convulsions, and died in one of those fits eight months after the first accident. A bullfinch belonging to a lady was subject to frightful dreams, under the pressure of which it would fall from its perch and beat itself in the cage; but no sooner did it hear the affectionate voice of its mistress than, notwithstanding the darkness, it became at once tranquil, and mounted its perch to sleep again. Buffon's story of the return of the escaped bullfinch is corroborated by the amiable qualities ascribed to it by Bechstein, for he says that, among other feats, it may be accustomed to go and return, provided the house is not too near a wood, and that the surest means of preventing too long an absence is to put a female bullfinch in a cage in the window, or to leave her in the room with her wing clipped; when the affection of the male will soon bring him back to her, nor will he ever abandon her altogether. Our limits will not permit us to dwell longer on the manners of this interesting little bird in captivity, and we must refer the reader for such information and the mode of treatment to Bechstein's 'Cage Birds' above referred to. Several hundreds of taught birds, we may observe, are annually sent to Berlin, London, and other capitals, by the German bird-sellers, and form a small article of commerce, at a price varying from one to several pounds sterling a piece, according to the merits of the bird. The time of the arrival of these merchants in London is April or May.

Food.—In a state of nature the bullfinch feeds on pine and fir seeds, corn, linseed, millet, rape and nettle seed, all sorts of berries, and the buds of most trees, among which those of the oak, beech, pear, plum, cherry, and gooseberry are favourites. Bewick says that in the spring it frequents gardens, where it is usefully busy in destroying the worms which are lodged in the buds. Busy it is; but we are compelled to add that its utility, to the horticulturist at least, is no longer questionable. In its devastation it may now and then, and no doubt does find a worm in a bud; but its object is the bud, not the worm. 'They feed most willingly upon those buds of trees which break forth before, indeed are pregnant with, the leaves and flowers, especially those of the apple-tree, pear-tree, peach-tree, and other garden trees: and by that means bring no small detriment to the gardeners, who therefore hate and destroy them as a great pest of their gardens, intercepting their hopes of fruit.' Such is Willughby's verdict. 'I have known,' says Selby, 'a pair of these birds to strip a considerable-sized plum-tree of every bud in the space of two days. These buds are not swallowed whole, but first minutely divided by the tomia of the powerful bill.' 'Its delight,' observes Mr. Knapp in his interesting and lively 'Journal of a Naturalist,' 'is in the embryo blossoms wrapped up at this season (spring) in the bud of a tree; and it is very dainty and curious in its choice of this food, seldom feeding upon two kinds at the same time. It generally commences with the germs of our larger and most early gooseberry; and the bright red breasts of four or five cock birds, quietly feeding on the leafless bush, are a very pretty sight; but the consequences are ruinous to the crop. When the cherry buds begin to come forward, they quit the gooseberry, and make tremendous havoc with these. I have an early wall cherry, a may-duke by reputation, that has for years been a great favourite with the bullfinch family, and its celebrity seems to be communicated to each successive generation. It buds profusely, but is annually so stripped of its promise by these feathered rogues, that its kind might almost be doubted. The Orleans and green-gage plums next form a treat, and draw their attention from what remains of the cherry. Having banqueted here a while, they leave our gardens entirely, resorting to the fields and hedges, where the sloe-bush in April furnishes them with food.'

Nest.—Bewick places it in bushes, and says that it is composed chiefly of moss,—Bechstein in the most retired part of a wood, or in a solitary quickset hedge, adding that it is constructed, with little skill, of twigs which are covered with moss. Graves says that it is mostly found in the thickest part of a black or white thorn bush, and that it is composed of small twigs and moss, and is lined with soft dry fibres. Temminck states that it builds in the elevated and least accessible forks of trees (dans les enfourchemens élevés et les moins accessibles des arbres). Mr. Rennie observes, that he is at a loss to conceive on what authority Montbeillard describes the nest as consisting of moss, lined with soft materials, with an opening said to be the least exposed to the prevailing wind; and no less why M. Temminck says 'it builds in the *most* elevated and least accessible forks of trees;' and he quotes Latham as declaring that the bird rarely uses moss, observing that he has seen a considerable number of the nests, and never found any of the circumstances stated by Montbeillard and Temminck hold good; and that he 'sometimes found them in low thick bushes, but most commonly on the flat branch of a spruce pine or silver fir,' usually about four feet from the ground, and sometimes lower. He is inclined to say that the bird never uses moss. Selby agrees with Rennie, generally speaking, and describes the nest as shallow and formed of small sticks, lined with a few root-fibres in a low tree, or in the thickest underwood; and so does Jenyns, who places it generally in thick bushes, and says that it is composed of dry twigs and lined with fibrous roots. These discrepancies may perhaps be accounted for by difference of locality and circumstances, for we know how birds will modify their selection of materials in conformity thereto. The eggs are generally four or five; Temminck says from three to six, but in this country the number is usually four, of a bluish-white, speckled and streaked with purplish or pale orange-brown at the large end, and rather obtuse. The young are generally hatched in May or the beginning of June, and there are frequently two broods in a year. Time of incubation fifteen days.

Geographical distribution.—The species is widely spread. They are common in most parts of northern Europe, extending into Russia and Siberia: in the south of Europe they occur only as birds of passage. They are said to winter in Italy. Gesner says that about the Alps the bird is called Franguel Invernengk—that is 'winter finch.' Bonaparte notes it as 'raro, d' inverno, Avventizio' near Rome. Thunberg long ago said that the common bullfinch was found in Japan, and this is corroborated by Dr. de Siebold, for it is one of the European species which he found in that country. The bird is particularly common in the mountainous forests of Germany; and it is from Cologne and other spots,

'Where Rhenus strays his vines among,'

that the market for piping-bullfinches is principally supplied. Bechstein mentions that there are schools for these little musicians in Hesse and Fulda, and at Waltershausen near Gotha. With us the bullfinch is a constant resident.

Description.—Male: length about six inches and three-quarters, two inches and three-quarters being taken up by the tail, which is rather forked, and of a lustrous black, shot as it were with iron blue. Bill six lines in length, short, thick, and black. Shanks eight lines high, and black. Irides of a chestnut colour. Crown of the head, circle round the bill, and upper part of the throat of the same hue with the tail. Nape, back, and shoulders deep grey, or rather bluish-grey. Cheeks, neck, breast, belly (to the centre of it), and flanks red. Rump and vent white. Greater wing-coverts tipped and margined with a French or pinkish-white, forming a transverse bar across the wing.

[Pyrrhula Vulgaris. Male.*]

Female.—Somewhat less than the male, and of a reddish-grey where he is red: back brownish-grey: feet brownish-black. The colours generally less bright than in the male.

Young of the year.—At first ash-colour, with wings and tail of blackish-brown; afterwards more like the female till the autumnal moult; but the young males may always be known by the greater tinge of red about the breast.

Varieties.—1. *Black.*—This variety may be produced artificially by feeding the bird entirely on hempseed, in which case a change of diet will often produce the true colours. Bechstein says it will arise from being kept when young in a totally dark place; and that females, either from age or from the diet above-mentioned, are most subject to it.

2. *White.*—This is merely an albino of an ashy or dusky white, or cream-colour, the parts which are generally black are more shaded than the rest. There is a specimen from Middlesex in the British Museum.

3. *Speckled* or *variegated.*—Spotted with black and white, or white and ash-colour, besides the natural hues. Selby says that Captain Mitford killed one, of which both the wings were white.

4. Bechstein mentions varieties under the name of the *Large Bullfinch*, about the size of a thrush, and the *middling* or *common*. He treats the *dwarf* variety, which is said to be not so large as a chaffinch, as a bird-catcher's story; for he observes that this difference of size occurs in all kinds of birds, and says he has had opportunities every year of seeing hundreds both wild and tame, and adds, that he has even found in the same nest some as small as redbreasts, and others as large as a crossbill.

HYBRIDS.

1. The offspring of a female reared in the house from the nest, and of a male canary. In shape and colour the hybrid partakes of the hues of the parents. Bechstein states that its note is very agreeable, and softer than that of the canary, and that the bird is very scarce, as the union rarely succeeds. When tried, a very ardent and spirited canary should be chosen.

2. The offspring of a bullfinch and female canary. The translator of Bechstein's interesting little book says, that the sexes above-mentioned once produced five young ones, that died on a journey which they could not bear. Their large beak, and the blackish down with which they were covered, showed that they were more like their father than mother.

ASIATIC SPECIES.

Of these we select *Pyrrhula Synoica* as an example. The

Pyrrhula Synoica. Upper figure male, lower figure female.

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* Its provincial names are Monk, Pope, Coalhood, Coallyhood, Hoop, Tony hoop, Alp, Nope. For Belon's opinion (in his folio edition) that the bullfinch is the συκαλὶς and μελαγκόρυφος of the Greeks, and our observations thereon, see BLACKCAP. The 'quatrain' in the small 4to, 1557, makes the bullfinch lay eighteen eggs.

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adult male is ornamented round the base of the bill with a circle of rich red, going off in spots upon the cheeks. The front is covered with small lustrous white feathers, of a silvery white, lightly shaded upon the borders with red; all the lower parts of the body, the inferior coverts of the tail and the rump are of a brilliant rose-colour, or clear carmine; the upper parts are ash-coloured, lightly tinged with rose: wings and tail brown, with ash-coloured borders.

The female is brown, of a light brown or earth-colour above, with longitudinal lines of deeper brown upon each feather. The lower parts are of a very clear brown or Isabella-colour, with longitudinal striæ of a somewhat deeper brown upon the middle of the feathers. The tail is slightly notched at the end, and the bill and feet in both sexes are of a clear brown. Length about 5 inches and 5 8ths. M. Hemprich found this species near Mount Sinai, in Arabia: and there are specimens in the museums of the Pays-bas and of Berlin. Temminck, from whose work the figures and description are taken, thinks it possible that 'the social bullfinch' may be found some day in the islands of the Grecian Archipelago, and that it may easily pass in its migrations the arm of the sea between Asia and those isles.

Temminck received his specimen from Professor Lichtenstein; and it was one of the discoveries of the travellers sent not long ago by the King of Prussia into Egypt with a view of obtaining objects of natural history.

A species from the Himalaya mountains, *Pyrrhula Erythrocephala*, figured in Mr. Gould's beautiful work, comes near to the common bullfinch of Europe except in the form of the tail, which is decidedly forked, while in the European it is nearly even There is a specimen of *Pyrrhula Erythrocephala* in the British Museum, and another in that of the Zoological Society.

African Species.

We select *Pyrrhula Gigathinea*. This species is characterized by a very thick bill, and a slightly notched tail. The colours of the sexes do not vary greatly. In the male a greyish colour tinted with bright rose covers all the lower parts of the body, the throat, and the circle round the bill; this tint is palest on the throat. The crown of the head is pure ash-colour, and an ashy brown is spread over the nape, the back, and the wing-coverts. A faint rose-colour tinges the plumage of the rump and the edges of the quills and tail-feathers, all of which are bordered towards the end with whitish upon a black ground. The two middle quills are the shortest. The wings reach to the extremity of the tail-feathers; and the bill is of a fine red. Length four inches six lines.

The female has no rosy tint except on the edges of the quills and tail-feathers, and on the rump, where it is very faint. The upper parts are of an Isabella-brown, and the wings edged with a brighter tint of the same. The circle round the bill and the throat are ash-coloured; the lower parts of a pure Isabella-colour; and the middle of the belly white. Bill same as in the male.

This bird is figured in the great French work on Egypt (plate 5, fig. 8), and was lately sent home by the German travellers to the north of Africa. It inhabits Egypt and Nubia. There are specimens in the Berlin museum, and in those of the Pays-bas and of Frankfort.

[Pyrrhula Gigathinea; lower figure, male.]

American Species.

We take *Pyrrhula Cinereola* as an example. Head, cheeks, back, and scapulars ashy-bluish, wings and tail darker, but all the feathers of those parts are bordered with ash colour. There is a small white spot on the wing, formed by the white towards the base of the quills, beginning with the fourth; the three first have no white. All the lower parts are white, with the exception of the flanks, which are clouded with ash-colour. Bill coral-red, very strong, large, and as it were swollen (bombé). Feet ash-coloured. Length 4¼ inches. Inhabits Brazil, where it is said to be common.

[Pyrrhula Cinereola.]

BULLIARD, PIERRE, a botanist, was born at Aubepierre-en-Barrois, about the year 1742, and studied at the college of Langres, where he early displayed a taste for natural history. After his preliminary education was finished, a situation was obtained for him in the abbey of Clairvaux, where he found time to prosecute his favourite studies; and though he afterwards removed to Paris, with a view to apply to medicine as a profession, his zeal for natural history induced him to devote himself entirely to this subject. Being previously an able draughtsman, he now learnt to engrave, and in 1774 published the 'Flora Parisiensis,' 6 vols. 8vo., the figures being drawn, engraved, and coloured by himself. In 1778 he published 'Aviceptologie Française, ou Traité général des toutes les ruses dont on peut se servir pour prendre les Oiseaux,' Paris, 1 vol. 12mo., reprinted in 1796. In 1779 he commenced his largest work, entitled 'Herbier de la France,' the first division of which, comprising 'L'Histoire des Plantes vénéneuses et suspectes de la France,' while in the course of publication in the form of numbers, was seized by the police, under the pretext that it was a dangerous work. More than 500 copies were seized; and it was not till after the lapse of seven months that the author was able to recover his property. Even then only thirty-seven copies were restored to him. This volume is therefore extremely rare, and its very existence is to many unknown, owing to the second division, or 'L'Histoire des Champignons,' bearing on the title-page the words 'Tome premier,' though it did not appear till 1790. The remaining six volumes contain only plates, principally of fungi, of which one livraison appeared annually, each containing 48 coloured plates, making in all 576; but at the end of the eighth volume are 24 plates, to which however there is no reference in the index of that volume.

This work was discontinued, owing to the death of the author in 1793. The letter-press in the first two volumes is not now of much value; but the plates of flowering plants are in general good, and have, in many instances, received the commendation of De Candollé: those of the fungi are frequently cited not only by the botanists of France, but by all writers on European fungi. It is to be regretted, however, that several inaccuracies in numbering the plates have in many instances led to confusion and error: a corrected index to the whole work would, by counteracting the effects of such inaccuracies, be of great utility. A second part of the work appeared at Paris in 1832, entitled 'Figures des Champignons, servant de Supplément aux Planches de Bulliard, peintes d'après Nature, et lithographiées par J. B. Letellier,' in small folio, six cahiers, containing the plates from 603 to 638.

Bulliard published also, in 1783, 'Dictionnaire Elementaire de Botanique,' Paris, in folio, with two plates. It was reprinted in the same form in 1797, and again, having been revised and remodelled by L. C. Richard, in 1779, in 8vo.; and subsequently, with many additions by the same eminent botanist, in 1802.

Bulliard was the inventor of the art of printing plates of natural history in colours, and he employed it in all his works.

BULLION, a term which is strictly applicable only to uncoined gold and silver, but which has been frequently used in discussions relating to subjects of public economy to denote those metals both in a coined and an uncoined state.

Among the earliest notices of the estimation in which the precious metals were held we find (Genesis, chap. xii.) that Abraham was 'rich in cattle, and in silver, and in gold.' For the field which he bought as a burial-place for Sarah he gave 400 shekels of silver, not in coined money, but 'by weight, according to the currency of the merchants.' (Gen. ch. xxiii.) Joseph, the descendant of Abraham in the third generation, was sold by his brethren for thirty pieces of silver; which makes it probable that silver bullion was then divided into pieces of known weight and fineness, answering the purposes of coin, if indeed this money was still uncoined. Frequent mention is made in the book of Kings of the gold of Ophir, a large amount of which was procured by Solomon for ornamenting the interior of the temple. The statements of Herodotus and other Greek and Roman writers concerning the amount of the precious metals possessed by some individuals are mixed up with so much that is improbable, that it is hardly possible to draw from them any certain conclusions. The supply of gold and silver in those days appears to have come from various quarters. Asia, Egypt, Nubia, Ethiopia, Thrace, and Spain, are said to have yielded the greater part. Little more than conjecture can be offered as to the amount of bullion which in those remote times was annually added to the stock in Europe.

The discovery of the mines in America did not at first add materially to the stock of bullion in Europe. Humboldt has estimated the amount which America furnished to Europe in the years 1492 to 1521 at 52,000*l.* per annum. During the 25 years that succeeded the conquest of Mexico in 1521, the annual supply, as estimated by the same authority, was 630,000*l.*, making a total addition of about 17,000,000*l.* sterling in the course of 54 years. At the end of this period, 1546, the silver mines of Potosi were discovered, and added very considerably to the produce of the American mines. In 1539 some gold mines had been opened in Chili; and the average annual supply of gold and silver to Europe from all these sources during the 54 years from 1546 to the end of the 16th century has been estimated at rather more than 2,000,000*l.* sterling. In the meantime the fashion of applying the precious metals to the making of articles of domestic utility as well as of ornament increased considerably. Another important vent for bullion was during this time found in the trade that grew out of the discovery of the route to India by the Cape of Good Hope, in the prosecution of which it was long necessary to pay for eastern products in gold and silver, because Europe had then little else to offer at prices which admitted of exportation to India. The improvements which since that time have been brought about in our manufacturing processes have so changed the nature of this trade, that the exports from England to India have at times much exceeded the value of the goods imported in return, and the balance has come forward in bullion.

During the 17th century Humboldt estimates the average annual supply of the American mines at 16,000,000 of dollars, about 3,333,333*l.*; in the next half century at 22,500,000 dollars, or 4,687,500*l.*; and in the 53 years following, viz., from 1750 to 1803, at 35,300,000 dollars—7,354,166*l.* The produce of single years at the beginning of the present century is stated to have been greater than the average here mentioned, and to have somewhat exceeded 9,000,000*l.* of sterling money.

The revolution in the Spanish American dominions in 1810 very materially affected the productiveness of the mines. The proprietors of many of them were forced to fly from the country, and the works of all the greatest mining establishments were either destroyed or suffered to fall to ruin. The effect of this political convulsion upon the production of the precious metals was immediate and important, but has perhaps been somewhat exaggerated. It appears from the returns sent to the English government by our consular agents, that the total value of bullion produced in the mining districts of Mexico and South America during 20 years, from 1810 to 1829, amounted to 60,165,891*l.*, being equal to an annual average supply of 3,008,294*l.* sterling money; the annual average value in the 20 preceding years, from 1790 to 1809, was 6,106,705*l.* The produce in part of the latter period has, owing to the application of English capital, been greater than it was in the first years following the revolution; and there is reason to expect that hereafter the mines in those quarters may yield a produce equal to anything they have formerly yielded. By returns received from the British consuls in Mexico and Peru, it appears that the gold and silver raised in those two states in the year 1834 amounted in value to 3,060,276*l.* No statement has yet been given of the produce in that year of the mines in Chili, in the republic of Rio de la Plata, Brazil, Columbia, and the republic of central America, the aggregate of which may be fairly estimated at 1,000,000*l.* sterling.

An official statement recently transmitted from Mexico mentions that the Fresnilla mines in Zacatecas, which were formerly worked on account of the government, have been leased to a company of private adventurers, natives of Mexico, who are already obtaining from the mines a weekly produce of from 70 to 100 bars of silver, each bar of 1000 dollars value. At the mean of these two rates, the yearly produce of the Fresnilla mines alone will amount to nearly one million sterling.

It is estimated by Mr. Jacob that the gold and silver annually yielded by the mines of Hungary and Transylvania amount to about 3,000,000 of florins (312,500*l.*).

The official statement published by the minister of finance in St. Petersburg gives the annual average produce of the gold mines in the Ural mountains, during the last 11 years, at a sum equal in English money to 606,724*l.* The silver yielded by the Altai and Da-urian mines is more loosely given, on the same authority, at 1000 poods per annum, equal in value to 130,000*l.* It is further stated, that during 1835 a considerable quantity of gold was procured by washings on the Altai mountains, but no estimate of the amount has been given. The government of Russia has of late years endeavoured to place platinum among the precious metals, by putting into circulation coins made of that metal; but the experiment does not appear to have answered. A want of confidence in the stability of its price makes it impossible to circulate any large amount of platinum coin. The minting of the platinum is confined to the produce of the government platinum mines.

A new source of supply, as regards gold, has lately been found in the U.S. of America. The first notice of gold of native produce, on the records of the mint of the U.S., occurred in 1814, when the value of 11,000 dollars (about 2300*l*.) was received in that establishment. The average received during the ten following years was very small, viz., 2500 dollars, or little more than 500*l*. In 1825 the amount received was 17,000 dollars (3500*l*.); and since that time the increase has been considerable. The gold region, which at first was thought to be confined to N. Carolina, has been found to commence in Virginia, and to extend to N. and S. Carolina, Georgia, Tennessee, and Alabama. The productiveness of this region since 1824 will be partially seen from the following table:—

	Virginia	N. Carolina	S. Carolina	Georgia.	Tennessee.	Alabama	Total.
	Dollars	Dollars.	Dollars	Dollars	Dollars	Dollars.	Dollars.
1824	. .	5,000	.	. .	.	.	5,000
1825	. .	17,000	. .	. .	. .	.	17,000
1826	. .	20,000	. .	. .	. .	. .	20,000
1827	. .	21,000	. .	. .	. .	. .	21,000
1828	. .	46,000	. .	. .	. .	. .	46,000
1829	2,500	134,000	3,500	. .	. .	. .	140,000
1830	24,000	204,000	26,000	212,000	. .	. .	466,000
1831	26,000	294,000	22,000	176,000	1,000	1,000	520,000
1832	34,000	458,000	45,000	140,000	1,000	. .	678,000
1833	104,000	475,000	66,000	216,000	7,000	. .	868,000
1834	62,000	380,000	38,000	415,000	3,000	. .	898,000
Dol	252,500	2,034,000	200,500	1,159,000	12,000	1,000	3,679,000

The gold in these states is sometimes found in the form of small particles of metal mixed with sand, and it is then obtained by the simple process of washing; in other places it occurs below the surface in the form of ore, which must be reduced by smelting. The gold of native production is said to be much greater in value than is indicated by the foregoing table, a part of the produce being exported in its uncoined state, without visiting the U. S. mint. This proportion has been variously estimated. One calculation carries the total produce of the entire district to five millions of dollars, or more than a million sterling, but this is probably an exaggeration. An able mineralogist, who lately visited America for the purpose of examining these mines, has given it as his opinion that, from the scantiness of the supply, as compared with the great extent of country over which it is spread, gold-mining cannot be profitably carried on upon a large scale, but must be in a great measure left to the industry of individual adventurers, acting upon a limited scale.

It is scarcely possible to make any near approach to accuracy, in estimating the consumption of the precious metals. Mr. Jacob, who has gone into some curious calculations upon the subject, estimates the annual consumption in Europe of gold and silver, for other purposes than that of coined money at very little less than six millions sterling. But some part of this amount is furnished by the re-melting of articles, the fashion of which has become obsolete, and by the burning of old gold and silver lace and other worn-out ornaments. Mr. Jacob estimates the part thus obtained at one-fortieth of the whole.

Attempts have been made to ascertain the loss in the wear of coins which have been in circulation for various periods. For this purpose an experiment was made in July, 1833, when Lord Auckland was Master of the Mint, upon 1200 sovereigns and 1200 half-sovereigns, 300 of each denomination having been put in circulation in 1817, 1821, 1825, and 1829, respectively, and upon similar numbers of silver half-crowns, shillings, and sixpences, which had been in circulation during the same number of years. The result of this experiment is given as follows:—

Gold.

300 Sovereigns of 1817, which had been 16 years in circulation had lost at the rate of 8*s*. 10*d*. per 100*l*. value.

300	,,	1821	,,	12 yrs.	,,	9*s*.	1*d*.
300	,,	1825	,,	8	,,	6	8
300	,,	1829	,,	4	,,	3	5½
300	Half-sovs.	1817	,,	16	,,	16	4
300	,,	1821	,,	12	,,	13	10
300	,,	1825	,,	8	,,	13	6¾
300	,,	1829	,,	4	,,	6	2

Silver. per 100*l*. value.

300	Half-crs.	1817	16	£2	7	
300	,,	1821	12	1	13	0
300	,,	1825	8	0	16	11
300	,,	1829	4	0	1	9
300	Shillings,	1817	16	4	19	0
300	,,	1821	12	2	18	5
300	,,	1825	8	2	1	6
300	,,	1829	4	0	8	11
300	Sixpences,	1817	16	5	11	11
300	,,	1821	12	4	1	5
300	,,	1825	8	3	3	4
300	,,	1829	4	1	8	7

The amount of gold and silver money coined at the English Mint, since 1790, has been as follows:—

			Gold.	*Silver.*
5	years,	1790—1794	£11,595,276	£251
5	,,	1795—1799	6,375,859	293
5	,,	1800—1804	2,392,039	265
5	,,	1805—1809	1,130,464	405
4	,,	1810—1813	1,148,921	263
3	,,	1814—1816	nil.	1,805,413
5	,,	1817—1821	17,611,560	5,561,252
5	,,	1822—1826	20,658,991	1,624,914
4	,,	1827—1830	8,355,831	157,719
4	,,	1831—1834	5,610,926	466,762

The small amount of silver stated above as having been coined previous to 1816 was what is called *Maundy money*, from the circumstance of its being distributed in alms by the king on Maundy Thursday.

A considerable part of the gold coined in the five years from 1817 to 1821 was exported to Paris, where it was melted and converted into Louis-d'or. The large amount coined in the next quinquennial period was required to supply the place of the 1*l*. and 2*l*. notes withdrawn from circulation in 1821, and by the commercial panic of 1825. [BANK—BANKING.]

BULLRUSH, the English name of typha latifolia and angustifolia, two wild marsh plants bearing long black cylindrical masses of flowers. The name is also sometimes applied to scirpus lacustris, a tall rushy-looking plant from which the bottoms of chairs, mats, &c. are often manufactured.

BULLS, PAPAL. Letters issued from the papal chancery, and so named from the *bulla* or leaden seal which is appended to them. The difference between bulls, briefs, and other Apostolical rescripts, is noticed under the word BRIEF. Bulls are written on parchment. If they regard matters of justice, the seal is affixed by a hempen cord; if of grace, by a silken thread. The seal bears, on the obverse, heads of St. Peter and St. Paul: on the reverse, the name of the pope, and the date of the year of his pontificate. In France, in Spain, and in most other kingdoms professing the Roman Catholic faith, bulls are not admitted without previous examination. In England, to procure, to publish, or to use them, is declared high treason by 13 Eliz. c. 2. The name Bull has also been applied to certain constitutions issued by the emperors. In affairs of the greatest importance bullæ of gold were employed, whence they were called Golden Bulls.

Eleven folio volumes, published at Luxemburg, between 1747 and 1758, contain the bulls issued from the pontificate of Leo the Great to that of Benedict XIV., from A.D. 461 to A.D. 1757. The two most celebrated among them are, that *In cœnâ Domini*, which is read every year, as these words imply, on the day of the Lord's Supper (Maundy Thursday): it denounces various excommunications against heretics and other opponents of the Romish see: 2. the bull *Unigenitus*, as it is called from its opening words, '*Unigenitus Dei, filius*,' issued by Clement XI. in 1713, condemning 101 propositions in Quesnel's work, or, in other words, supporting the Jesuits against the Jansenists in their opinions concerning divine grace.

The most remarkable *Imperial Bull* is that approved by the Diet of the Germanic empire in 1356, in which Charles IV. enumerated all the functions, privileges, and prerogatives of the electors, and all the formalities observed in the election of an emperor, which were considered as fundamental laws till the dissolution of the Germanic body in 1806. We believe that the Latin original is still preserved at Frankfort with the golden seal, or *bulla*, from which it derives its name, appendant to it.

BULWER, JOHN, an English physician of the seventeenth century, who devoted himself to the discovery of methods for communicating knowledge to the deaf and dumb. Dr. Wallis is generally regarded as the originator, in England, of an art by which the benefits of instruction are bestowed on the deaf, and in the 'Memorials' of his own life he appears in unrivalled possession of this honour. But Bulwer, a contemporary of Wallis, has claims which only need to be known to entitle him to the credit which has so generally been given to another. That Wallis was disingenuous on this subject, in more than one instance, is evident from a notice of Dalgarno's works, which appeared in the 'Edinburgh Review,' No. cxxiv. Whether Bulwer and Wallis had received intelligence of what had been accomplished by Ponce and Bonet in Spain cannot now be determined. It is probable that Bulwer had obtained no such information, for his mode of treating the subject is very original, and rather that of an inventor than a copyist. The earlier practice of Wallis is in many respects similar to the methods pursued by Bonet, as detailed in his work, published in 1620. [Bonet.] It is probable that Bulwer did not use a manual alphabet, for he mentions, with a degree of admiration, the employment of this medium of communication, in the case of a gentleman who became deaf through disease. Wallis used no finger-alphabet in his first attempts, but he seems to have been aware of its utility, for in after-years he appropriated, without acknowledgment, the one which Dalgarno invented. Sir Kenelm Digby, who was deeply impressed with Bonet's success in Spain, would probably send the first intelligence of his labours to England. Sir K. Digby had much correspondence with Dr. Wallis on philosophical subjects previous to 1658, in which year Wallis published the results of that correspondence. As Wallis had published a treatise on speech in 1653, it is highly probable that the results, then new and curious, which Digby had witnessed in Spain in the instruction of the deaf and dumb, would be communicated by him to his philosophical friend. Wallis did not make public the inventions which he claimed for instructing the deaf till 1670, several years after Digby's death, though he introduced his first pupil, Mr. Whalley, before the Royal Society in 1662, after a year's instruction.

It has been considered necessary thus to trace what Dr. Wallis accomplished, in order to place Bulwer in his proper light, and to show the value of his performances; in estimating which, it must not be forgotten that no English writer, as far as can be now ascertained, had previously employed himself on the subject which Bulwer attempted to elucidate. A few years before 1648 Bulwer published 'Chironomia, or the Art of Manual Rhetoric,' and 'Chirologia, or the Natural Language of the Hand.' These are the works which obtained for him the surname of 'the Chirosopher.' They formed part of that system of artificial language which he designed to employ in developing his philosophical views, and by which he proposed to lead the deaf to a knowledge of spoken language. Bulwer's chief work is entitled 'Philocophus, or the Deafe and Dumbe Man's Friend, exhibiting the philosophical verity of that subtile art which may inable one with an observant eie to heare what any man speaks by the moving of his lips. Upon the same ground, with the advantage of an historical exemplification, apparently proving, that a man borne deafe and dumbe may be taught to heare sounds of words with his eie, and thence learn to speak with his tongue. By J. B., sirnamed the Chirosopher. London, 1648.'

Bulwer's principles of instruction may be gathered from the above works: they appear to have been imitative signs, or the language of action; the labial alphabet, or reading the movements of the lips; and articulation. There was an originality in his conceptions which no prior or contemporary author on the subject, in this or any other country, could claim. He noticed the power which the deaf possess of hearing sounds through the teeth, an experiment which may be made in various ways, especially by means of a musical box or a repeating watch. He also produced several other works, among which were the following:—'Tractatus de removendis loquelæ impedimentis;' 'Tractatus de removendis auditoris impedimentis.' It is probable that these treatises were not published; their titles occur at the end of one of his curious works, which appeared in 4to. in 1653, called 'Anthropo-metamorphosis,' man transformed, or the artificial changeling, in which he shows the great variety of shapes and dresses which men have assumed in the different ages and nations of the world. He also published 'Pathomyotomia, or a dissection of the significative muscles of the affections of the mind,' 1649, 12mo.

Bulwer must be regarded as a man of persevering research, and though not an instructor of the deaf and dumb, he was undoubtedly the first in England to point out a safe and certain path which teachers might pursue.

BUNDELCUND or **BOONDELA,** a division of the prov. of Allahabad, in Hindustan, lies between 24° and 26° N. lat., and 77° and 82° E. long. This territory is bounded on the N. by the river Jumna; on the E. by Baghulcund; on the S. by Malwa and Berar; and on the W. by the possessions of Scindiah. In its form, Bundelcund is an irregular parallelogram; its greatest length is in the direction from S.E. to N.W.; its area comprises nearly 24,000 sq. miles; and the population consists of 2,400,000 souls.

There are three ranges of mountains in Bundelcund, which extend in continuous ranges parallel to each other. One of these ranges, which forms part of the Vindhyan chain, is less sterile and rugged than the part of the same chain which passes through Bahar. On the summit of this range a considerable extent of table-land occurs, which is 1200 ft. above the level of the Gangetic plain. The second mountain range, called the Panna ghauts, runs parallel to the Vindhyan chain at the distance of about 10 m. The third range, called the Bandair, occurs at about an equal distance beyond the second to the N.W., and comprises the most elevated part of the province.

The soil of Bundelcund presents a very great variety. The valleys and low lands consist principally of rich black loam: the hilly country and elevated table-land are in great part composed of poor and sterile soil. The fertile tracts, when assisted by irrigation, produce abundant harvests of every kind of grain and plant that is cultivated in Hindustan: the principal produce of the poorer lands is millet. There are no forests in this division of the province. Iron is found among the hills, where also catechu or terra Japonica is produced in abundance.

The principal rivers of Bundelcund are the Betwah, the Desan, and the Ken or Cane. The Betwah rises in Gundwana, 3 m. S.W. of the Shahpoor ghaut, and flowing N. enters Bundelcund at 25° 3′ N. lat., and 78° 19′ E. long. It crosses the prov. in a N.E. direction, and falls into the Jumna, near Kalpee, in 26° 10′ N. lat. and 79° 41′ E. long. The Desan or Desaun rises in the Vindhyan chain in Bhopaul, and flowing N.E. through Malwa, enters Bundelcund in 24° 12′ N. lat. and 78° 47′ E. long.; following the same course, it joins the Betwah near to its junction with the Jumna. The Ken or Cane rises in 23° 53′ N. lat. and 80° 8′ E. long., flows N.E., and enters Bundelcund in 24° 34′ N. lat. and 80° 01′ E. long.; its course is then N.E., and afterwards nearly due N., until it falls into the Jumna in 25° 47′ N. lat. and 80° 28′ E. long. Neither of these rivers is navigable. Some very large reservoirs have been constructed for purposes of irrigation in different parts of the country: these works must have cost immense labour.

The principal towns are Banda, the capital; Bejour, Jeitpore, Jhansi, Chatterpore, Callinger, and Tehree.

Banda is situated in 25° 30′ N. lat. and 80° 20′ E. long. about 90 miles W. from Allahabad. This town has much increased of late years, having, early in the present century, been only a village of moderate size. The cotton brought for sale to its market is of superior quality. Bejour is in 24° 38′ N. lat. and 79° 27′ E. long. Jeitpore is in 25° 17′ N. lat. and 79° 32′ E. long. Jhansi, the capital of a petty Boondela state under British protection, is situated in 25° 32′ N. lat. and 78° 34′ E. long. This is a considerable town, the centre of an active trade carried on between the Deccan and the towns of the Doab: it contains a considerable carpet manufactory, and large quantities of the warlike weapons used by the Boondela tribes, such as bows, arrows, and spears, are made there. Chatterpore, in 24° 56′ N. lat. and 79° 35′ E. long., is about 135 miles W.S.W. from the city of Allahabad: it was formerly a place of considerable trade, but has much decayed of late years. The manufacture of coarse cotton cloths, used for wrappers, is carried on there. Callinger is a fortified town in 25° 6′ N. lat. and 80° 25′ E. long.: it stands on a lofty mountain, the base of which is 10 miles in circuit. The walls include the whole summit of the hill, and are composed of rough uncut stones. The fortress was a place of great strength, and occasioned considerable loss to the British besieging army before it was carried in 1812. The fortress was dismantled and the works were destroyed by the British government in 1820, at which time the town was of considerable extent. Tehree, or Teary, is on the N.W. frontier of Bundelcund, in 24° 45′ N. lat. and 78° 52′ E. long. This town is the residence of an independent Boondela chief or rajah, possessing several villages, and having a revenue of four lacs of rupees (40,000*l.*).

The British connexion with the chiefs of Bundelcund originated in an arrangement concluded with the late Peishwa in December, 1803, by which he ceded to the British territory in that province of a certain value, which they were at liberty to select from those quarters of the province most contiguous to the British possessions, and the best suited to their convenience. In carrying this treaty into effect, arrangements were made with several chiefs on the frontier of the province, who were allowed to retain possession of the lands which they held. With some of these chiefs treaties still exist similar to those contracted with other protected states, except that they contain no stipulation for the payment of tribute; but the far greater number of Bundelcund chiefs, having been considered subjects of the Peishwa, are now considered British subjects. These chiefs have been guaranteed by the British in their possessions, and in return have subscribed engagements of allegiance and subjection. In general, the British government has allowed these chiefs to govern their territory as they pleased; but occasionally, during the minority of the chief, or when by misgovernment the country has been thrown into disorder, the government has exercised its sovereignty by appointing a manager.

The territory of Bundelcund has preserved its Hindu usages in a greater degree than most other parts of Hindustan that have come under foreign rule. Among the usages thus continued is the system of punchayet for settling disputes by arbitration under the superintendence of the Mocuddums or heads of villages. The selection of the arbitrators has always been made by the disputing parties, and they are chosen generally from the most respectable of the tribe or profession to which the parties belong. Disputes arising out of matters of account, and claims of bankers, are settled by arbitrators consisting of the most respectable persons of that profession; and the same practice is observed with regard to other professions. If the subject is rent, the head zemindars are generally chosen, and residents of neighbouring villages are commonly preferred to their own townsmen. Boundary disputes are settled in the same way, and a large assemblage from the surrounding villages are often invited to witness the settlement. This in former times has sometimes led to violent affrays, and has even occasioned the loss of lives, thus causing continual feuds, and laying the foundation for future disorders. Under these circumstances, the officers of the former government forbore to interfere, except the realization of the revenue was endangered, when their influence was interposed for the adjustment of the dispute. Under the immediate and active superintendence of European authority, such disorders have been suppressed. The greatest evil arising from this system of punchayet lies in the frequent futility of the award, from the want of power to enforce it.

(Rennell's *Memoir of a Map of Hindustan*; Mill's *Hist. of British India*; *Report of Committee of House of Commons*, 1832, *Public*, *Revenue*, *Judicial*, *and Political Sections*.)

BUNDER ABBAS. [Gombroon.]

BUNGAY, a m. t. in the hund. of Wangford, Suffolk, on the Waveney, which surrounds it in the form of a horseshoe. It is 31 m. N.E. of Ipswich, and 91 m. N.E. from London. Bungay is divided into two parishes, Holy Trinity and St. Mary, the combined pop. of which, in 1831, was 3734. The gross annual income of the living of St. Mary is 115*l.*; that of Holy Trinity, 305*l.*; both are in the diocese of Norwich. The market day is Thursday; there are two annual fairs on May 14th and Sept. 25th.

Bungay is a vil. of considerable antiquity, formerly dependent on Bungay Castle, supposed to have been erected by the Bigods, earls of Norfolk; some ruins of the castle still remain. There are also the ruins of a Benedictine nunnery. Bungay was nearly destroyed by a fire in 1688, and the town is consequently of modern date. There are two handsome crosses in the market-place. A considerable trade is carried on in grain and articles of provision, the Waveney being navigable up to Bungay for small barges. A printing establishment here formerly had considerable reputation, and was a kind of depôt for the issue of publications and reprints of works in a cheap form.

Bungay has a free grammar school, endowed with a school-house and premises and two estates, from the proceeds of which ten children are educated; twenty-two daily schools; two boarding-schools; four Sunday schools; and one infant national school.

(*Education Returns* of 1835; *Beauties of England and Wales*; *Pop. and Ecc. Returns*.)

BUNKER'S HILL. [Boston.]

BUNTING. [Emberiza.]

BUNYAN, JOHN, was born at Elstow, near Bedford, in 1628. His parents, who were of very mean condition, were Puritans, and Bunyan was strongly imbued with the principles of that sect. After being initiated in his father's profession as a tinker, he served in the Parliament army, and was present at the siege of Leicester, in 1645. Ten years afterwards, he was admitted member, and chosen preacher of a Baptist congregation at Bedford. At the Restoration, he was convicted of holding unlawful assemblies and conventicles, and sentenced to banishment. Until his transportation could take place, he was imprisoned, and he was not released until after a confinement of twelve years and a half, when Barlow, Bishop of Lincoln, applied in his favour. He maintained himself in gaol, during this most cruel persecution, chiefly by making tags and laces. After his release, upon the declaration of James II. for liberty of conscience, he resumed his occupation of preacher, at Bedford. He died in London of a fever, in 1688.

His works were collected in two volumes folio, 1736-7: among them the 'Pilgrim's Progress' has attained the greatest notoriety. If a judgment is to be formed of the merits of a book by the number of times it has been reprinted, and the many languages into which it has been translated, no production in English literature is superior to this coarse allegory. On a composition which has been extolled by Dr. Johnson, and which in our own times has received a very high critical opinion in its favour, it is hazardous to venture a disapproval, and we perhaps speak the opinion of a small minority when we confess that to us it appears to be mean, jejune, and wearisome.

BUNZLAU, a circle in the government circle of Liegnitz, and in the province of Prussian Silesia. Its area is about 422 square miles, and it contains two towns (Bunzlau and Naumburg on the Queis), a colony of Herrnhuthers, and 87 villages, with about 48,900 inhabitants. It is in general a flat country, and is watered by the Bober and Queis, neither of which streams is here navigable. It is full of forests, and has numerous low hills; it grows little grain but much flax, and large quantities of potatoes, vegetables, and fruit; and breeds numerous flocks and herds. The spinning of yarn and weaving of linen are carried on to a considerable extent.

The town of Bunzlau lies on the Bober, and is surrounded by a double line of walls and a deep ditch; it possesses three churches (one Lutheran and two Roman Catholic), an orphan asylum and school, an hospital, a seminary for teachers, and manufactures of woollens, linens, stockings, earthenware, &c. and has well-frequented markets for horses, cattle, and grain. Population about 4700. Much earthenware is exported. Topazes, agates, chalcedonies, and other valuable stones are found in the neighbourhood. It was the birthplace of Opitz, the poet, who died in 1639. About 150 miles S.E. of Berlin; 51° 15′ N. lat., 15° 32′ E. long.

BUNZLAU, a circle of Bohemia, which extends nearly from the centre of that kingdom to the confines of Saxony and Prussian Silesia in the N.W. and N.E. Its area is about 1617 square miles, and it contains 28 towns (among which are Yung-Bunzlau, Nimburg (2407 inhabitants), Reichenberg (11,500), Althalberdorf (3600), Friedland (3100), Reichstadt (1900), and Gablonz (3250), 18 market villages, 1034 villages, and about 395,850 inhabitants. The principal river is the Iser, which traverses the country from the borders of Biczow and falls into the Elbe: the latter river skirts Bunzlau for a short distance in the S.W. The Giant Mountains (*Riesengebirge*) extend through its W. and N.W. districts and are covered with extensive forests, which yield much timber and potashes. In this part there are some iron mines and glass-works, as well as a considerable growth of flax. The plains are sandy and destitute of water; yet they have been rendered very productive in grain, fruit, and hops: a small quantity of wine is also made. Bunzlau is full of manufactures, particularly of yarn, linens, cottons, woollens, glass, and paper: these are principally carried on in the mountainous districts, which are extremely populous. Some gold and silver is also obtained, together with semi-precious stones.

YUNG-BUNZLAU, the capital of this circle, is situated on a hill, the base of which is skirted by the Iser, and contains about 500 houses and 4950 inhabitants. It is well built, and has a handsome town-hall, a castle now used for barracks, six churches, some of them handsome structures, two monasteries, a gymnasium and head-school (*hauptschule*), an hospital, and besides an extensive cotton factory, manufactures of woollens, leather, soap, &c. It is said to have been founded by King Boleslaf in 975; at least its Bohemian name of 'Mlada Boleslaf' is derived from that monarch. 50° 23′ N. lat., 14° 55′ E. long.

BUONAFE'DE, APPIA'NO, born in 1716 at Comacchio in the papal state, entered the order of the Celestines, in which he rose gradually to the highest dignities. He was elected general of the whole order in 1777, in which capacity he went to pay his homage to the king of Naples as feudatory of the crown for several fiefs which the Celestines possessed in that kingdom. He spent the latter years of his life at Rome, where he died in December, 1793. He wrote several works, especially philosophical speculations, and the history of philosophy antient and modern. 1. 'Della Istoria e della Indole d'ogni Filosofia,' Lucca, 7 vols. 8vo. 1781. This work treats of the philosophy of the antients and that of the middle ages till the 15th century. 2. 'Della Ristaurazione d'ogni Filosofia nei secoli xvi., xvii., and xviii.,' 3 vols. 8vo. Venezia, 1786-9. This work was translated into German by Heydenreich, with many additions, under the title. 'Agatopisto Cromaziano's Kritische Geschichte der Revolutionen der Philosophie in den drey lezten Jahrhunderten,' Leipzig, 1791. Buonafede had assumed in the Society of the Arcadi the academical name of Agatopisto Cromaziano, under which most of his works were published. His is the only history of philosophy written in Italian. The style is fluent and pleasing, and well adapted to popular reading; but the matter of the work displays more historical learning than searching criticism. Buonafede's judgments are mostly impartial and independent, as much perhaps as could be expected from one of his profession, and from the times and place in which he wrote. It is a curious though by no means singular instance of the contradictory judgments passed upon writers on polemical subjects, that while Buonafede was looked upon in high quarters at Rome as being too favourable to what was called the philosophy of the 18th century, on which account it was said he never obtained a cardinal's hat, though he had long aspired to it: others, and his biographer among the rest, have taxed him with monkish intolerance, and with being too subservient to the court of Rome. Buonafede wrote also, 3. 'Delle conquiste celebri, esaminate col natural diritto delle genti,' 8vo. Lucca, 1763. 4. 'Storia critica e filosofica del suicidio ragionato,' 8vo. Lucca, 1780: an investigation of the circumstances which have attended many cases of suicide recorded in history. 5. 'Ritratti poetici, storici, e critici di varj moderni uomini di lettere,' in a series of sonnets, with interesting biographical notes. The author has traced his own moral portrait among the rest. 6. 'Storia critica del moderno diritto di natura e delle genti,' Perugia, 1789; 7. 'Del Pirronismo teologico e politico;' 8. Dell' apparizione di alcune ombre;' 9. 'I filosofi fanciulli,' a satirical comedy after the manner of Aristophanes; 10. 'Orazione per le belle arti;' 11. 'Della libertà poetica, epistola.' These two little works are remarkable for good taste and bold criticism. 12. 'Discorsi della malignità storica,' or strictures on Sarpi's history of the Council of Trent; 13. 'Della impudenza letteraria,' being a sharp review of the biographical memoirs of the same Sarpi written by Griselini. Buonafede's criticisms were in general bitter and virulent, as an example of which we cite the 'Bue Pedagogo,' which he wrote against Baretti. (Ugoni, *Della Letteratura Italiana*; Mazzuchelli, *Scrittori d'Italia*; *Elogio Storico di Agatopisto Cromaziano*, Venezia, 1795.)

BUONAROTTI, M. ANGELO. [ANGELO, MICHAEL.]

BUONAPARTE. [BONAPARTE.]

BUOYS,—French, *Bouées*; German, *Ankerboyen*; Dutch, *Ankerbooien*; Danish, *Ankerbojer*; Swedish, *Ankerbojor*; Italian, *Gavitelli*; Spanish, *Boyas*; Portuguese, *Boias*,—are vessels formed of wood, cork, or some other substance which is specifically lighter than water. They are moored or anchored so as to float on the surface of the water at some certain spot, in order to point out the course or channel that a vessel should follow. Buoys are also used for the purpose of marking the situation of ships' anchors, to which they are attached, and thus facilitating the future recovery of the anchor and cable in cases where the latter has been broken, or where it has been cut, in order to provide on emergencies for the safety of the ship, when time or other circumstances do not admit of the anchor being weighed into the vessel. The first description of buoys are denominated public, and the last private buoys. Another kind of buoys are those placed in harbours to mark the situation of mooring chains to which ships frequenting the port are made fast.

Until the 36th year of Queen Elizabeth all public buoys in this kingdom were under the management of the Lord High Admiral, but in that year (1594) the queen, by a warrant dated 11th of June, granted to the corporation of the Trinity-house of Deptford-strond the right of 'making, erecting, setting up, placing or laying out, all buoys, beacons, marks and signs for the sea or sea-shore, to hold the same with all profits and emoluments thereunto belonging, as of the manor of East Greenwich, in free and common soccage.' On laying down any public buoy, the officers of the Trinity-house corporation gave notice to the public of its form, colour, and exact situation, and of the reason for its being laid down; and notifications are also made upon their removal, whether the same arises from design or through accident. By the act 6 Geo. 4. c. 125, it is provided, 'that every person who shall ride by, make fast to, or remove, or wilfully run down or run foul of any vessel placed to exhibit lights, or any buoy or beacon belonging to, or placed by, any corporation or society having lawful authority to place the same, shall, besides being liable to the expense of replacing or making good any damage occasioned thereby, forfeit for every such offence any sum not exceeding 50*l*., nor less than 10*l*.' The amount of revenue annually collected for the use of buoys by the Trinity-house corporation is between 11,000*l*. and 12,000*l*. The charge made is according to the tonnage of the vessels frequenting the ports in or leading to which buoys are placed: the rates vary according to circumstances, and are highest in the port of London, where British and foreign *privileged* vessels (those belonging to countries with which we have 'reciprocity treaties') pay one penny per ton, and foreign vessels not privileged pay two-pence per ton.

Protection is given to private buoys by the 1st and 2nd Geo. 4. c. 75, in which it is enacted, that 'if any person shall wilfully cut away, cast adrift, remove, alter, deface, sink or destroy, or in any way injure or conceal any buoy, buoy-rope, or mark, belonging to any ship or vessel, or which may be attached to any anchor or cable belonging to any ship or vessel, whether in distress or otherwise, such person so offending shall, upon conviction, be adjudged guilty of felony, and shall be liable to be transported for any term not exceeding seven years, or to be imprisoned for any number of years, at the discretion of the court.'

BU'PALUS (*Leach*), a genus of lepidopterous insects, of the family geometridæ. Technical characters:—palpi very short: antennæ, in the males, pectinated on each side to the apex; in the females simple: wings erect during repose; the anterior wings in the males having a protuberance at the base. Larva smooth and furnished with ten legs.

B. piniarius (called the *bordered white* by Haworth) is a beautiful moth, which, when the wings are expanded, measures rather more than an inch in width. Its wings on the upper side are of a dusky brown colour, and adorned with numerous pale yellow spots; and beneath clouded with the same dusky colour and having two brown stripes. The caterpillar is green, with a white longitudinal stripe down the middle of the back, and four other stripes of a yellowish colour placed two on each side of this. It feeds upon the *Pinus sylvestris* and *P. abies*; in the neighbourhood of which species of firs the moth is not uncommonly seen flying during the daytime. (Stephens's *Illustrations of British Entomology*.)

BU'PHAGA (Zoology), Buphagus, Brisson, a genus of birds whose form, admirably adapted to their manner of life, in some points resembles that of the merulidæ (blackbirds), while its habits approach those of the sturnidæ (starlings); but the form, notwithstanding, presents such strong points of difference, that most ornithologists agree in viewing it as the type of a family, Buphagidæ, of which at present one genus only, that named at the head of the article, containing two species, is known. The following is Temminck's generic character:—

Bill strong, large, obtuse, nearly quadrangular; lower mandible stronger than the upper; both swollen towards the point.

Nostrils basal, oval, half closed by a vaulted membrane.

Feet moderate; shank (*tarsus*) longer than the middle toe; three toes before, one behind, the lateral toes equal, the external toe conjoined at the base, the internal one divided; claws hooked, compressed.

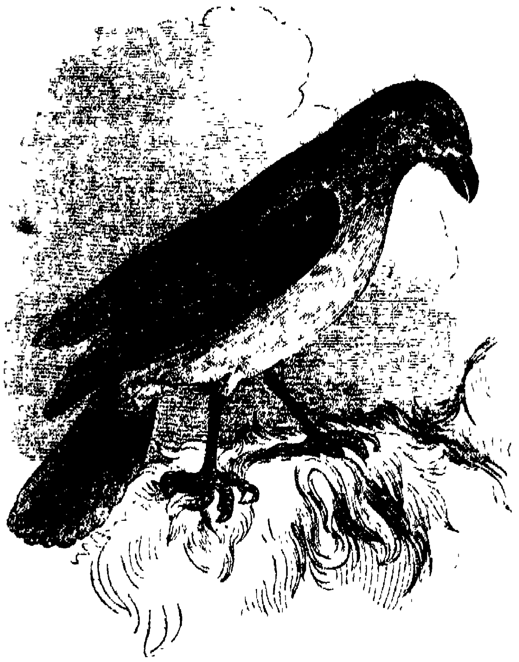
Wings moderate; the first quill very short, the second nearly the length of the third, which is the longest.

The only two species known live principally upon those parasitic insects, the larvæ (maggots) of which are hatched under the skin of some of the larger ruminants and birds, a mode of life which is followed by some of the crows (corvidæ) and the pastors. The quadrupeds on whom the Buphaga waits are principally those of the ox family, the antelopes, and the camels, and, generally, the other ruminants both wild and tame. Fixed on the backs of these by his cramp-irons of claws, the *Beef eater*, as he has been called by the English, and *Pique-bœuf* by the French, digs and squeezes out with his forceps of a beak the larva that lies festering under the tough hide of the quadruped.

Le Vaillant gives the following account of the habits of *Buphaga Africana*, which is distributed through southern Africa, and found also at Senegal. The bill of the *Pique-bœuf* is fashioned as a pair of solid pincers to facilitate the raising up out of the hides of quadrupeds the larvæ of the gadflies, which are there deposited and nourished: the species, therefore, anxiously seeks out the herds of oxen, of buffaloes, of antelopes—of all the quadrupeds, in short, upon which these gadflies deposit their eggs. It is while steadied by a strong gripe of the claws in the tough and hairy hide of those animals that, with strong blows of the bill and powerful squeezes of the skin, at the place where the bird perceives an elevation which indicates the presence of a maggot, he extracts it with effort. The animals, accustomed to the treatment, bear with the birds complacently, and apparently perceive the service which they render to them in freeing them from these true parasites, which live at the expense of their proper substance. The *Pique-bœufs* however are not the only birds that perch upon the backs of quadrupeds and large birds, for many other omnivorous species have the same habit; but these last content themselves with only taking away the parasites which are attached to the skin of those animals, not having in their bills the necessary strength for extirpating the larvæ which are lodged beneath it; an office which the *corvus albicollis* (Le Corbivau) executes as well as the *Pique-bœufs*.

The *Pique-bœufs* are generally seen in company, but they never fly in large flocks. Le Vaillant rarely saw more than six or eight in the same herd of buffaloes or antelopes; and M. Rüppell never observed them except in bands consisting but of few individuals about the camels of his caravan. They are very wild and difficult of approach, so that there is no chance of obtaining either the one or the other species except by hiding behind an ox or a camel and driving it gently, in the manner of a stalking horse, towards those beasts on whose backs the birds are perched. When sufficiently near, the fowler shows himself, and brings them down while on the wing. Besides the larvæ of the gadfly, these birds eat the ticks when they are full of blood, and all sorts of insects generally.

We select as an example *Buphaga erytrorhincha* (*erythrorhyncha*), the species last recorded, described by Temminck and received by him some years since from the Cape of Good Hope, whither it had been brought with a small number of other species from Madagascar. Many since that time have reached Europe, part of the fruits of the travels of Ehrenberg and Rüppell in northern Africa. 'Notre *Buphaga erytrorhyncha* du voyage de Salt,' says Temminck, 'is distinguished from its congener by a smaller and less powerful bill, by the red colour of that organ (whence it is called in French *Pique-bœuf, Bec-corail*—Coral-bill, Beef-eater)—by the more sombre tints of its upper plumage, and, finally, by its smaller proportions. The upper parts, head, and throat in the adult are ash-brown, glazed as it were with bluish; the lower parts are yellowish-rust or dark isabella-colour. The total length is seven inches, about one-third less than *Buphaga Africana*, whose bill is yellow, and whose geographical distribution seems to lie in the southern districts and on the western coasts, parts of the country to which Temminck expresses his belief that *Buphaga erythrorhyncha* does not penetrate. Temminck, from whose work our figure and description are taken, says that no particulars as to the structure of the nest, its position, or the period of incubation, are yet known.



[Buphaga erythrorhyncha, male.]

BUPRE'STIDÆ (Leach), a family of coleopterous insects of the section Pentamera and subsection Sternoxi (Latreille). The section Sternoxi is composed of two great groups or families, the one of which we are about to treat (Buprestidæ), and the Elateridæ: the species of the former group are distinguished from the latter principally in having the tarsi dilated (the penultimate joints of which are bilobed) and furnished beneath with velvet-like pellets: the thorax nearly straight behind, and the mandibles entire, *i.e.*, without any notches internally near the apex—and likewise in having the terminal joints of the palpi cylindrical, or nearly so.

The form of the body in the Buprestidæ is somewhat ovate, the apex of the elytra being more or less pointed, and the base of the thorax of nearly equal width with that of the elytra: the head is placed almost vertically, and is deeply inserted into the thorax, so that the eyes nearly come in contact with that part.

In splendour of colouring, this family of insects surpasses all others among the Beetle tribe, the Cetoniadæ perhaps excepted: green appears to be the most frequent colour, but shades of blue, red, golden or copperlike hue are not uncommon, and these colours are in most cases brilliant or, as it were, burnished.

The Buprestidæ are found on the trunks and leaves of trees, and likewise on flowers (on the latter, more particularly the smaller species), and when touched, or frequently even when approached, they apply their legs and antennæ close to the body, and allow themselves to fall to the ground, a means of escape frequently practised by insects: they crawl slowly, but in hot sunny weather are frequently on the wing and fly rapidly.

About 500 species have been discovered belonging to this tribe, which are for the most part from the tropics. In this country about twenty have been found at large, of these however several have most probably been imported with timber in which their larvæ feed.*

The genus Buprestis†, which is now only restricted to a few of the species of this family, is distinguished principally by [illegible] following characters:—Antennæ serrated from the third [illegible]urth joint to the apex; labrum attenuated and slightly emarginated anteriorly; scutellum distinct; body nearly ovate.

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* An instance is recorded by Mr. Marsham, in the 10th vol of the 'Linnean Transactions,' of one of these insects eating its way out of a desk which had been in Guildhall for 22 years; and there are reasons for believing that the insect must have been in the desk during the whole of that time, and the greater part probably in the larva state.

† The name Buprestis (Βούπρηστις) was applied by the antients to certain

BURA, one of the twelve cities of Achæa, situated on a hill nearly forty stadia from the sea. When Helice, another of the Achæan towns, was swallowed up with all its inhabitants by a great earthquake, accompanied by an inundation of the sea, Bura also was shaken so violently that the statues in the temples were thrown down. All the inhabitants perished except such as happened to be absent on military service or for other reasons, who formed the future population of Bura. (Herod. i. 145; Pausanias, vii. 25; Strabo, pp. 54, 59, 386, Casaub.)

[Coin of Bura. Brit. Mus.]

BURBAGE, or **BURBADGE, RICHARD**, the original performer of the principal tragic characters of Shakspeare, was the son of James Burbage or Burbadge, also an actor, and it is presumed a countryman of Shakspeare's, and to whom, with four others, Queen Elizabeth granted, in 1574, the first royal patent conceded in this country to performers of plays. James Burbadge built the Blackfriars Theatre in 1576, and in 1596 we find the name of his son Richard appended with Shakspeare's to a petition to the Lord Chamberlain to be allowed to continue their performances therein. In 1603 'Richard Burbage' is one of the actors included in the license granted by King James I. to Lawrence Fletcher, William Shakspeare, and others. In March, 1615, we find him and other 'stage players' summoned to appear before the privy council for disobeying a special order of the Lord Chamberlain, prohibiting the acting of plays during Lent; and in 1620 his name is again mentioned in the grant of a new patent by King James licensing his 'well-beloved servants to act, not only at the Globe, on the Bankside, but at their private house situate in the precincts of the Blackfriars;' but he is said to have died on or about the 13th of March in that year, and the patent bears date the 27th. He was buried in the church of St. Leonard, Shoreditch, having resided in Holywell Street in that parish from the year 1600. His will is still extant in the Prerogative Office, but it contains nothing remarkable. By his wife, Winifred, he had four daughters, *two* of whom were christened 'Juliet,' his partiality for that name arising, it has been supposed, from his having been the original performer of Romeo. Richard Burbadge is introduced in person in an old play called the 'Returne from Parnassus,' and instructs a Cambridge scholar how to act the part of Richard III., in which character he appears to have been greatly admired. Bishop Corbet, in his 'Iter Boreale,' speaking of his host at Leicester, says,

'When he would have said King Richard died,
And called "a horse, a horse," he Burbage cried.'

In the 'Gentleman's Mag.' for 1825 there is an elegy on the death of R. Burbadge, long preserved in MS., and Mr. Payne Collier, in his 'Annals of the Stage,' quotes another copy, subsequently found with the important addition of some lines naming four of the parts in which Burbadge especially excelled, viz., Hamlet, Hieronymo, Lear, and probably Othello. According to the anonymous author Burbadge's disorder first attacked his speech, and he thus adverts to the loss the stage sustained by his decease:—

'Hee's gone, and with him what a world are dead,
Which he revived to be revived soe:
No more young Hamlett, old Hieronymoe,
King Lear, the cruel Moore, and more beside,
That lived in him, have now for ever dyed.'

The whole elegy extends to 86 lines; it ends thus,—

'And thou, deare earth, that must enshrine the dust
By heaven now committed to thy trust,
Keepe it as pretious as the richest mine
That lyes intombed in the rich womb of thine;
That after times may know that much-loved mould
Fro others dust, and cherish it as gold.
On it be laide some soft but lasting stone,
With this short epitaph endorst thereon,
That every one may reade, and reading weepe,
"'Tis England's Roscius, Burbadg, that I keepe."'

A shorter epitaph is however accorded to him in Philpot's additions to Camden's Remains, more concise even than the well-known one of Ben Jonson, being simply 'Exit Burbadge.'

Flecknoe, in his short discourse of the English stage, 1664, speaks most highly of his abilities, and a similar testimony is paid to them by Sir Richard Baker. The former calls him 'a delightful Proteus,' the latter pronounces him to have been 'such an actor as no age must ever look to see the like.'

Burbadge is said to have possessed also considerable talent as an artist. In the 'New Particulars concerning Shakspeare' lately published by Mr. Payne Collier allusion is made to the fact, and the portrait of Shakspeare (commonly called the Felton), now in possession of Mr. Nicol of Pall Mall, is, from the circumstance of the initials R. B. on the back of it, supposed to be his painting.

(*Annals of the Stage*, and *New Particulars*, &c. by J. P. Collier; Flecknoe's *Short Discourse*, 1664; Bishop Corbet, *Iter Boreale*, &c.)

BURCKHARDT, JOHN LEWIS, was born at Lausanne, in Switzerland, about the year 1784. His father, who was of an antient family of Basle, being obliged to leave Switzerland in 1798 in consequence of the French invasion, entered a Swiss corps then serving in Germany in the pay of England. In the year 1800 young Burckhardt went to study at Leipzig, from whence he afterwards removed to Göttingen. Having left Gottingen he came to England in 1806, with recommendations to Sir Joseph Banks, then an active member of the committee of the African Association. The association having lost all hopes of receiving intelligence from Mr. Hornemann, who had attempted to penetrate into Central Africa by the way of Fezzan, resolved to send another traveller in the same direction. Burckhardt made an offer of his services, and his offer was accepted in 1808. Meantime he had been preparing himself by studying Arabic and attending lectures on chemistry, astronomy, medicine, and surgery. In January, 1809, he received his instructions from the committee: he was to proceed first to Syria, there to remain two years to perfect himself in the Arabic, and afterwards to proceed by Cairo to Mourzook in Fezzan, from whence he was to cross the great desert to Soudan. He arrived at Malta in April, 1809, and reached Aleppo in September, having first assumed the eastern dress and the name of Ibrahim. From Aleppo he made several journeys to Damascus and Palmyra, and into the Haouran, and among a tribe of Turkmans who live to the N.W. of Aleppo. He also gained much information concerning the Bedoween tribes of Syria and Arabia, and concerning the Wahabees, who were then making incursions near to the gates of Damascus. After remaining two years and a half in Syria, Burckhardt proceeded towards Egypt by Palestine and the country east of the Dead Sea, and then by the great valley of Ghor or Araba, which extends from the southern shore of the Dead Sea to Akaba on the Elanitic gulf of the Red Sea. This interesting valley and the neighbouring monuments of Wadi Mousa had been unexplored by former travellers. Burckhardt did not go as far as Akaba, but struck across the desert to Suez, and thence to Cairo, where he arrived at the beginning of September, 1812. As there was no favourable opportunity of proceeding to Fezzan for the present, Burckhardt set off for Upper Egypt and went into Nubia, where no European traveller had ever been beyond Derr. He left Assouan towards the end of February, 1813, and passing the cataract of Wadi Halfa, went as far as Tinareh in the country of Mahass, and on his return visited the temples of Abousambul, Dandour, Gyrshe, Kalabshe, &c. He passed the rest of that year in Upper Egypt, and on the 1st March, 1814, set off from Daraou with a caravan which was proceeding to Upper Nubia across the desert east of the Nile. In this journey he followed nearly the same track as Bruce on his return from Abyssinia. After suffering much through the desert,

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insects, which when eaten by the cattle whilst grazing, created inflammation, &c. There is no doubt however that those insects belonged to a tribe differing from that to which the term Buprestis is now applied. Various have been the conjectures on this subject. The opinion of Messrs. Kirby and Spence is, that the Buprestis of the ancients was a species of the genus Mylabris. (See 'Introduction to Entomology,' vol. i., p. 156.)

he arrived in the country of Berber, and thence went to Shendi. At Shendi he set off with a caravan for Suakin on the Red Sea. After having forded the Atbara (the Abyssinian Tacazze) above its junction with the Mogren, a river that rises in the mountains of the Bishareen, and which after its confluence with the Atbara gives its name to the united stream which flows into the Nile, he proceeded to Taka, a remarkably fertile and populous district in the midst of the desert. Its fertility is owing to the periodical inundations of large torrents coming from the S. and S.E. (probably the Abyssian Mareb). Burckhardt gives an interesting account of Taka and of the country of Beja, of which it forms part, and which to the S. borders upon Abyssinia. [BEJA.] Taka was the most southern point of Burckhardt's travels. He thence proceeded N.E., and crossing the Langay Mountains, arrived at Suakin towards the end of June. From Suakin he sailed for Jidda, where he arrived in July, 1814.

These two Nubian journeys of Burckhardt, the journals of which were published together in one volume, furnished much interesting and for the most part novel information. The appendix contains also many valuable notices on Borgo, Bornou, and other countries of Soudan west of Darfur, which Burckhardt collected in Egypt and Nubia, as well as extracts from Makrizi and Ibn Batuta.

From Jidda Burckhardt proceeded to Tayf, five days' journey inland, where he found Mehemet Ali, who after having taken possession of Mecca and all the Hejaz, was preparing an expedition into the Nejd, the country of the Wahabees. The pasha, who had known Burckhardt at Cairo, received him favourably, and he was also fortunate in obtaining a supply of money from the physician of Tousoun Pasha, Mehemet Ali's son.

Burckhardt next visited the city of Mecca, which till then had been forbidden ground to Europeans, and went through the whole of the ceremonies in the character of a Mussulman pilgrim, without, as he believed, having excited any suspicion as to his real character. He spent three months at Mecca; and on the 25th of Nov., 1814, performed the hadji or pilgrimage to mount Arafat, in the company of more than 80,000 pilgrims from all parts of Islam. In Jan., 1815, he visited Medina, a city of which still less was known in Europe than of Mecca. He felt ill at Medina, and after some months, having recovered sufficient strength, he went to Yembo, where he embarked for Tor, in the peninsula of Sinai, and thence returned by Suez to Cairo in June, after an absence of nearly two years and a half, of which he had spent nine months in Arabia.

The particulars of Burckhardt's Arabian journey furnished the most complete account of the Hejaz and its two holy cities Mecca and Medina, ever transmitted to Europe. Ali Bey (the Spaniard Badia) had visited Mecca a few years before Burckhardt, who said that he had no reason to doubt his general veracity, though his description of Mecca was incorrect in some points, and his information rather superficial. Ali Bey spoke only the Moghrebin or western Arabic. Seetzen, a German traveller, sent by the Duke of Saxe Gotha, and of whom Burckhardt speaks with great respect, travelled in Arabia about the same time as Ali Bey, and died of poison at Mocha, in 1811. Since Burckhardt, Mecca and Medina have been visited by several Europeans in the service of Mehemet Ali. (Planat, *Régénération de l'Egypte*, with a plan of Mecca.)

One of Burckhardt's objects in visiting Mecca as a pilgrim was to be enabled to assume the title of Hadji, which he conceived would prove of great advantage to him in his travels in the interior of Africa. But his residence in Arabia undermined his constitution, and he never recovered from the effects of the deleterious climate and unwholesome water of that country. He spent the following nine months after his return from Arabia partly at Cairo and partly at Alexandria, endeavouring to recruit his health impaired by repeated attacks of fever, and preparing his Nubian and Arabian journals to be sent to the Association. In April, 1816, the plague having broke out at Cairo, he set off for the desert of Sinai. He visited that mountain, as well as the shores of the Elanitic gulf, and returned to Cairo about the middle of June. Here he proposed to Mr. Salt the project of removing the head of Memnon from Gourneh, and having it conveyed to England as a present to the British Museum; for which purpose they engaged, at their joint expense, Belzoni, who accomplished its removal to Cairo. [BELZONI.] Burckhardt remained at Cairo waiting for the long-expected caravan from Fezzan, with which he intended to proceed on its return to that country. For several years past no caravan from Fezzan had made its appearance at Cairo. In Oct., 1816, he forwarded to the Association his 'Notes on the Bedoweens and the Wahabees,' which were afterwards published in a separate volume, and contain much new information. Burckhardt felt a peculiar interest for the Bedoweens of Arabia, whom he considered 'as the original stock from which the Arabian population of Syria, Egypt, and Barbary is derived; and also as the only Mohammedan nation who in the midst of the utter depravity of manners and morals, and the decline of laws and civil institutions throughout the Mohammedan world, have preserved unchanged their antient customs and the manners of their forefathers, and still continue to be what they were 1200 years ago, when their emigrating tribes conquered part of Asia, Africa, and Europe.' (Burckhardt's *Letter from Cairo*, 15th of Oct., 1816, inserted in his life.)

In the autumn of 1817 it became known at Cairo that among the pilgrims collected at Mecca that year was a party of Moghrebins or western Africans, who were to return home by way of Cairo and Fezzan; and it was believed that the caravan would take its departure from Cairo about December. Burckhardt had now transmitted to England all his journals, and was contemplating with the greatest satisfaction the moment when he was at last to set out on the main object of his mission, for which he had so long and so assiduously been preparing himself. But at the beginning of October of that year he fell ill at Cairo of the dysentery, and notwithstanding every medical assistance, he expired in the night of the 15th. He communicated his last intentions to Mr. Salt, in a composed and collected manner. His last words were about his mother, when he became strongly affected. 'As for my body,' said he, 'I know the Turks will have it (as he had passed in Egypt for a Mussulman); perhaps you had better let them.' Accordingly he was buried as the Mohammedan sheik Ibrahim, and his funeral was conducted with all proper regard to the respectable rank which he had held in the eyes of the natives. He had won the universal esteem of both Christians and Mussulmans. His death, at the early age of 33, when he had so well fitted himself for the purposes of African discovery, was greatly deplored in Europe. Burckhardt's personal character stood deservedly high, as any one who peruses the extracts of his correspondence with the Association, and the account of his last interview with Mr. Salt, both inserted in his life, must feel convinced. (See also Salt's *Correspondence* in Hall's *Life of Salt.*) He left his collection of Oriental MSS. to the University of Cambridge. His journals were published after his death by the African Association. They consist of—1. 'Travels in Nubia,' 4to., 1819, with a 'Life of Burckhardt;' 2. 'Travels in Syria and the Holy Land,' 4to., 1822; 3. 'Travels in Arabia,' 2 vols. 8vo., 1829: 4. 'Notes on the Bedoweens and the Wahabees,' collected during his travels in the East, 4to., London, 1830.

BURDWAN, one of the 17 districts into which the province of Bengal is politically divided, is situated to the west of the river Hoogly, between 22° and 24° N. lat., and 87° and 89° E. long. Burdwan is bounded on the north by Birbhoom and Rajshahy, on the west by Midnapore and Ramghur, on the south by Midnapore and Hoogly, and on the east by the last-named district and Nuddea. Its area, which is computed at 2400 square miles, is covered with a dense population. A census taken in 1814 established the fact that the district then contained 262,634 dwellings, of which 218,853 were occupied by Hindus, and 43,781 by Mohammedans. Computing the number of each family at five and a half persons, the average rate in that part of India, the total population of Burdwan must at that time have amounted to 1,444,487 souls, of whom five-sixths were Hindus, and one-sixth Mohammedans. The population thus ascertained gives an average of 602 persons to each square mile, being three times the average proportion in the United Kingdom.

The district of Burdwan, which forms part of the valley of the Ganges, is a level tract. The principal river flowing through it is the Dummooda, which enters the district at its western extremity, flows east to the town of Burdwan, and then making an abrupt turn to the south, joins the Hoogly a few miles below Fulta. Except for a short time during the rainy season the Dummooda is not navigable, but the district being well provided with roads, the deficiency of water-carriage is of less importance.

The greater part of the soil is very fertile, and produces abundant crops of sugar, indigo, betel, tobacco, and cotton, besides the cereal grains usually cultivated in Bengal. A considerable quantity of silk is likewise produced. Compared with the surrounding districts, Burdwan has the appearance of a garden.

The native zamindars are generally wealthy; the more considerable of them usually reside in Calcutta, leaving their properties to the management of resident agents. An extensive trade is carried on by native merchants.

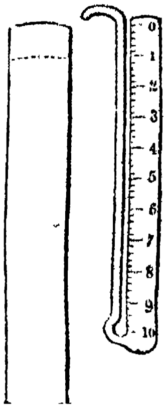
The rajah of Burdwan is the most considerable zamindar under the Bengal presidency, his annual jumma or rent amounting to 40 lacs of rupees (400,000*l.*), which amount is said to be less than one-half of the sum collected by him from his tenants. These tenants form a numerous class, who, like the *middlemen* in Ireland, have divided their holdings among sub-tenants, reserving a profit-rent to themselves. These sub-tenants, imitating the example of those above them, have again divided their farms among persons who have made yet another division, so that there are five removes between the ryot or actual cultivator and the supreme government, while each of the intermediate tenants derives a profit from the land. The individuals forming the several links of this chain are all considered to have a permanent possession of their leases, which descend as of right to their heirs. This permanency, as regards the ryots, is of recent introduction, and is owing to the interference of European officers, who have put a stop to a system which prevailed of ejecting them if they did not agree to pay exorbitant rates.

Coal-mines have been worked in this district for nearly 20 years, but the operations have not been extensive for more than half that period. The extent of the coal-field has not been ascertained, but is known to be great; the mines now worked are in the possession of an English company, whose rights extend over 4 miles of surface. The seam is 9 feet thick, and is found 90 feet below the surface. The annual produce is from 14,000 to 15,000 tons; and the works being situated on the bank of a river connected with the Hoogly, the coals are conveyed in the rainy season down that river to Calcutta, where they are sold at 20*s.* the chaldron. The quality of the coal is inferior to that of England, which sells in the same market at from 30*s.* to 40*s.* per chaldron. Coal is still but little used for culinary purposes in India. The Burdwan coal is chiefly used for steam-engines, and it has lately been applied to the burning of bricks; some of it is exported to Singapore.

The town of Burdwan, the capital of the district, and the residence of the British agent, is situated in 23° 15′ N. lat., and 87° 57′ E. long., about 60 miles N.N.W. from Calcutta. At the census of 1814 it was found that this town contained 9805 houses, the number of persons inhabiting which, according to the mode of calculation usually adopted, was 53,927. The proportion of Mohammedans was greater in the town than in the entire district, having been 11,847, or about two-ninths of the whole number of inhabitants. The rajah of Burdwan resides in the town, in which he has a palace with large gardens.

(Rennell's *Memoir of a Map of Hindustan; Rep. of Committee of House of Commons*, 1830 and 1832.)

BURETTE, an instrument in chemistry, invented by M. Gay Lussac, for the purpose of dividing a given portion of any liquid into 100 or 1000 equal parts. It is accompanied by a cylindrical glass measure, containing, when filled to the line A, ½ litre; and if the fluid to be divided be less than this quantity, the deficiency must be supplied by water. In filling this measure, it is the surface of the fluid which must be made to coincide with this mark, and not the outer margin elevated by capillary attraction above the general level. The burette consists of a large tube graduated into 100 equal parts (in the figure only half the number of the small divisions are represented), and numbered from the top downward; and of a small tube connected with the former at the base, and recurved at the top. Through this tube, if the beak be slightly greased, the contents of the large tube may be poured with great precision, either by single drops or in a full stream. The largest divisions are 1-100 of the large measure, and the smallest 1-1000, and these may be subdivided by counting the number of drops of the fluid under examination, which are poured out in reducing the surface of the liquid from any division to the next inferior one. The superiority of the burette over other measures consists in the decimal arrangement of the graduations, and the great rapidity and precision with which any required portion of a liquid may be added or abstracted, while one hand only is employed, the other being left at liberty to use the stirring rod or test paper.



The burette, though applicable to the processes of the analytic chemist, is a very useful instrument in manufactories where the value of numerous samples of acids, alkalies, bleaching powder, &c. has to be quickly and correctly ascertained: though in general use in France, it is almost unknown in this country. (*Essai des Potasses*, par M. Gay-Lussac; *Instruction sur l'Essai du Chlorure de Chaux*, par M. Gay-Lussac.)

BURFORD. [OXFORDSHIRE.]

BURG, a town in the circle of Jerichow I., in the Prussian province of Saxony, is situated on the Ihle or Ehle, and surrounded by a wall with five gates. It contains three squares or public places, three Lutheran churches, and one Calvinistic church with a French pastor, one civic school of the first class (*höhere Bürgerschule*), an hospital and a poor-house, about 1130 houses, and 12,800 inhabitants, among whom are a number of settlers from the French, Palatinate, and Swiss territories. In 1817 the population was 9101. Burg has considerable manufactures, particularly woollens, which employ upwards of 1300 hands, and produce annually above 70,000*l.* in value of that article. Yarn and linens, pottery, &c. are made; it has also some tanneries and dyeing works and a brisk wool trade. Agriculture, including the growth of tobacco, hops, and chicory, and the rearing of cattle and sheep, are carried on with success in the immediate environs. Most of the manufacturers in the place are the descendants of French emigrants. It is the seat of civil and judicial administration for the circle. About 75 miles S.W. of Berlin.

BURGAGE TENURE denotes the particular feudal service or tenure of houses or tenements in antient cities or boroughs. It is considered to be a species of socage, as the tenements are holden of the king or other lord, either by a certain annual pecuniary rent, or by some services relating to trade or handicraft, such as repairing the lord's buildings, providing the lord's gloves or spurs, &c., but 'no way *smelling* of the plough or tillage' (Somner on *Gavelkind*, 142–148), and having no relation to military service (Spelman's *Glossary, ad verbum*). The incidents of this tenure, which prevailed in Normandy as well as in England, vary according to the particular customs of each borough, in consequence of the maxim that, in improper feuds (to which class this tenure belongs), the *lex et consuetudo loci* are always to be observed. (Wright's *Tenures*, p. 205.)

Burgage tenure is supposed by Littleton and other writers to have been the origin of the rights of voting for members of parliament in cities and boroughs; and the great variety of those rights is in some measure accounted for by supposing them to be founded upon varying local customs. It is however impossible to trace the gradual steps by which the irregular rights of voting in boroughs for members of parliament, which are continued by the reform act (2 Will. IV. c. 45) until the extinction of existing interests, were derived from burgage tenure.

BURGEON, or **BOURGEON**, an obsolete English and modern French name of a leaf BUD.

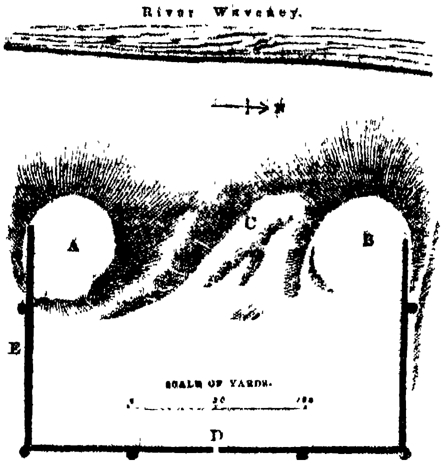
BÜRGER, GOTTFRIED AUGUST, the son of a clergyman, was born at Walmserwemde, near Halberstadt, in January, 1748. While at school he showed no aptitude for grammatical studies, but a great liking for poetry. In 1768 he went to Göttingen, where he wasted his time and money in dissipation, in consequence of which his friends withdrew their assistance from him. But having formed an intimacy with several distinguished fellow-students, Voss, Count Stolberg, Sprengel, and others, who had established a literary club for their mutual improvement, Bürger, encouraged by them, began to mend his course of life, and to apply himself earnestly to the study of the classics as well as the modern poets. Among the latter Shakspeare became his favourite. Some ballads which he wrote at that time having attracted notice, he obtained a situation at Alten Gleichen, and his grandfather agreed to pay his debts and to give him further assistance, but through the dishonesty of a friend Bürger lost the money. An imprudent marriage increased his embarrassments. He however soon after separated from his wife, and went to live at Göttingen, where he passed the remainder of his life, first as a private teacher, and afterwards as professor of philosophy, but without any fixed salary. His misfortunes imparted a tinge of melancholy to several of his poetical compositions. After lingering some years in bad health and poverty, he died in 1794. He published two volumes of poems, which were republished after his death with additions by his friend Karl Reinhard: 'Bürger's Gedichte,' 2 vols. 8vo. Göttingen, 1796. A third volume was published by Reinhard in 1797, containing several specimens of translations from the Iliad, both in iambics and hexameter verse, with dissertations by the author. Bürger's ballads and romances have long been popular in Germany. His 'Leonora' has been translated into English: 'Bürger's Leonora,' by Wm. Robt. Spencer, fol. London, 1796. A few more translations from Bürger are contained in the 'Specimens of the German lyric poets,' Lond. 1823, with a short biographical notice of the author. Bürger's romances are grounded upon local traditions and legends, and he makes great use of the feeling of terror produced by apparitions and other supernatural agency, always directed however to the object of moral retribution. His 'Wilde Jäger,' or 'Fierce Huntsman,' is a good specimen of this sort. Bürger's amatory poems are soft and pleasing, and unexceptionable on the score of morality. His language is easy and clear. He is altogether one of the first German lyric poets, although Schiller has judged him rather severely. A. W. Schlegel says of Bürger, that 'he is a poet of an imagination more original than comprehensive, of feelings more honest and candid than tender or delicate, is more successful in the execution than in the invention of his subjects, and more at home in romance than in the loftier regions of the lyric muse.' (Mad. de Staël, *L'Allemagne*, Schlegel; and the *Biographical Notice* above mentioned.)

BÜRGER, a German appellative, denoting a citizen or freeman of a municipal town. It is derived from 'burg' (Borough), and is more particularly used in speaking of those inhabitants of a free town in Germany or Switzerland who have the right of voting at the election of members for the legislative council. The right of burghership, whether in a free town or in a mere municipal town of the above-mentioned countries, is, or was until very lately, acquired either by inheritance or by purchase. The French word 'bourgeois' was originally synonymous with 'bürger,' but it now means simply any native inhabitant of a town, without necessarily implying the possession of municipal rights, which in France have been much restricted by the encroachments of the central government, and are become of much less importance than in Germany.

BURGESS. [BOROUGHS OF ENGLAND AND WALES.]

BURGH CASTLE, an antient Roman encampment, is situated on the borders of Suffolk, and on the east side of the river Waveney, near its confluence with the Yare. Its form is nearly a regular parallelogram, 642 ft. long by 400 ft. broad: the walls are about 14 ft. high and 9 ft. thick.

On the east side, the walls, which are furnished with circular watch-towers, are almost perfect, but those on the north and south sides are partly in ruins; the west wall, if there ever was one, has entirely disappeared. The site of the encampment is slightly elevated towards the west, and the interior is irregular, which may be accounted for on the supposition that the small eminences are occasioned by the ruins of former edifices. The whole area of the inclosure was about 4 acres and three-quarters. The walls are of rubble masonry, faced with alternate courses of bricks and flints: and on the tops of the towers, which are attached to the walls, are holes 2 ft. in diameter and 2 ft. deep, supposed to have been intended for the insertion of temporary watch-towers probably of wood.



[Plan of Burgh Castle, the antient Garianonum, Suffolk.]

A, B, Raised mounds.
C, Ground falls at this point.
D, Porta Decumana.
E, Walls in a ruined state.

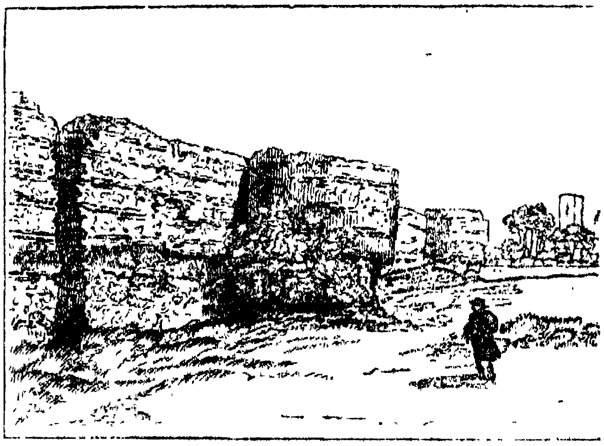
On the east side the four circular towers are 14 ft. in diameter. Two of them are placed at the angles, where the walls are rounded, and two at equal distances from the angles; an opening has been left in the centre of the wall, which is considered by Mr. King to be the Porta Decumana, but by Mr. Ives the Porta Prætoria. The north and south sides are also defended by towers of rubble masonry. The foundation on which the Romans built these walls was a thick bed of chalk lime, well rammed down, and the whole covered with a layer of earth and sand, to harden the mass and exclude the water: this was covered with two inch oak plank placed transversely on the foundation, and over this was a bed of coarse mortar, on which was roughly spread the first layer of stones. The mortar appears to be composed of lime and coarse sand, unsifted, mixed with gravel and small pebbles or shingle. Mr. Ives thinks they used hot grouting, which will account for the tenacity of the mortar. The bricks at Burgh Castle are of a fine red colour and a very close texture—they are one foot and a half long, one foot broad, and one inch and a half thick.

The west side of this station was probably defended in antient times by the sea, which is now however at some distance; the river Waveney being at present the western boundary. The fact of the sea having receded is proved by an old map of Gariensis Ostium, as it is supposed to have appeared in the year 1000. A copy of this map was made from the antient plan in the time of Elizabeth, and is preserved in the archives of the corporation of Yarmouth. In confirmation of this circumstance there have been discovered at Burgh Castle, parts of anchors, rings, and other large pieces of iron.

Garianonum may have been founded by Ostorius Scapula, who subjected the Iceni in the reign of the Emperor Claudius. Both Camden and Mr. Ives place the prætorium in the S.W. corner of the station, but King, in his 'Munimenta' (vol. ii., p. 53), considers it to be an additional work by the Saxons or Normans, similar to the Saxon keep at the S.E. corner of the Castrum at Pevensey in Sussex, and accordingly he places the prætorium indefinitely on the west. Camden and Ives both assert that the towers were added after the walls. There are some remains of a fosse on the south side.

Mr. King calculates that Burgh Castle was capable of containing one whole cohort and a half with their allies (ii., p. 116). Several Roman coins and other antiquities have been discovered here: the oldest is a copper coin of Domitian. A coin of Gratian, of silver, and some coins of Constantine have also been found; some silver and gold coins were given by J. Smith, Esq., the former possessor of the place, to Dr. Moore, bishop of Norwich. Besides these coins found both in the inclosure and in a field contiguous to the castle, there have been found coarse urns, a silver spoon with a pointed handle, bones of cattle, coals, burnt wheat, rings, keys, fibulæ (*buckles*), and a spear-head. This field is supposed to have been the burial-place.

The earliest modern notice of Burgh Castle is in the reign of Sigebert, 636, when Furseus, an Irish monk, having collected a company of religious persons, settled at Burgh Castle, then called, according to Bede, Cnobersburgh. In the time of Edward the Confessor, bishop Stigand held Cnobersburgh by socage. The castle was afterwards held by Robert de Burgh, from whom the present name is probably derived. It was surrendered in the reign of Henry III., who, in the 20th year of his reign, gave it to the monastery of Bromholde in the county of Norfolk. It afterwards came into the possession of laymen. For some curious particulars concerning the manor, see Ives' 'Garianonum,' from which much of the above information is derived; Camden's 'Brittania,' and King's 'Munimenta Antiqua:' also a plan and view in the British Museum. The plan and view in this article were made by W. B. Clarke, architect, in 1834.



View of the perfect side of Garianonum with two of the towers and the Porta Decumana.

BURGLARY. The derivation of this word is quite uncertain. By some writers it is supposed to have been introduced by the Saxons, and to be compounded of *burg*, a castle or house, and *larron* or *latro*, a thief. But Spelman conceives that the term was introduced into the criminal law of England from Normandy, and says that he finds no traces of it among the Saxons. (Spelman's *Glossary, tit. Burglaria, and Hamesecken.*) The offence of burglary at common law is defined to be 'a breaking and entering the dwelling house of another in the night, with intent to commit some felony within the same, whether such felonious intent be executed or not.' By the statute 7 and 8 Geo. IV. c. 29, sect. 11, entering the dwelling-house of another with intent to commit a felony; or being in such dwelling-house and committing a felony, or in either case breaking out of the house in the night-time, was declared to constitute a burglary, and to be punishable with death. The leading characteristics of this offence are, 1st, that it must be committed in the night-time, that is, at a time when people are presumed to be sleeping; and therefore it is said in the books, that if there be a sufficient dawning of 'daylight or *crepusculum*, either begun or left, enough to see a man's face withal,' when the offence is committed, it will not be burglary. The reason of the rule is that the offence, to be complete, must be committed in the dead of night, and it follows from this reason that a burglary may be committed in the brightest moonlight.

2. There must be a breaking and entering of the house; which parts of the offence however are completed by the robber even breaking a pane of glass and putting in his hand with a felonious intention.

3. The house broken must be the dwelling-house, or, as it is called, the 'mansion-house' of the person injured. By this is meant that it must be a permanent dwelling, and not a booth or tent; and also that it must be the place of the actual and personal residence of man, and not a mere stable, barn, or out-house: unless such buildings are connected with the dwelling-house. Upon this part of the subject a great variety of nice distinctions have arisen, for which we refer to HOUSE-BREAKING.

An indictment for burglary is rarely presented or tried at the present day, unless in very aggravated cases where capital punishment is probable, as several recent statutes have rendered the prosecution for house-breaking a simpler and equally efficient proceeding.

BURGOMASTER, BÜRGERMEISTER, is the title of the chief magistrate of a municipal town, answering to the English mayor. In the German free towns the bürgermeister is the president of the executive council of the republic. This is also the case at Zürich, Basel, Schaffhausen, and some other Swiss cantons; while at Bern, Freyburg, and Luzern, the corresponding magistrate is called schultheiss (in French 'avoyer'), and in the rest of the cantons landamman; which last is not a German but a Swiss term.

BURGOS has been supposed to be of Roman origin, but the fact is, that, after the most careful research, it is hardly possible to trace the existence of Burgos farther back than the reign of Alphonso I. of Asturias and Leon, who colonized as it were part of that very territory, which then began to change its former name of Burdulia, or Vardulia, for the modern one of Castile. Some of the new settlers having constructed a few habitations on the fine banks of the Arlanza and Arlanzon, formed six boroughs or hamlets, vestiges of which are still recognizable at the hermitages of Santa Cruz, San Juan Bautista, and Santa Coloma. These six boroughs or burgos (a name, according to Andreas Braccio, introduced into Italy and Spain by their northern invaders) were incorporated into a single or rather collective borough, by Diego Porcelos, whom Alphonso III. directed, in the year 884, to erect a castle on a commanding hill on the right bank of the Arlanzon. As in process of time the Moors receded farther and farther to the S. of Burgos, the higher parts of the town were abandoned for a lower and more comfortable situation towards the plain; so that the *calle alta*, the street which is now the highest, was formerly the lowest of the city, and probably the best, since in it the native leading patriots, Fernan Gonzalez, and the Cid, had once their palaces. A triumphal arch in honour of the former hero, and the mausoleum of the second, now mark the spot before covered with those structures.

As long as Burgos was animated by the presence of its sovereign alternately with Toledo, commerce flourished, industry was excited, and manufactures were multiplied. Its crowded fairs displayed wealth and prosperity; and it was the entrepôt of all the trade that was carried on from the interior of Spain with the several ports on the Bay of Biscay. It was also the residence of an important factory of many foreign merchants; and the once famous Segovian wool cloth was transmitted from this city to every quarter of Europe. But when Charles V. transported the seat of royalty, in the beginning of the 16th century, to Madrid, its prosperity began rapidly to decline, and in three generations it was so impoverished and depopulated, that its former 40,000 inhabitants and upwards dwindled to 9000 and less, leaving to Burgos the bare honour, which it still retains, of being the capital of Old Castile, and of the province (partido) and archbishopric of its own name.

Burgos retains a certain air of antiquity and departed glory. It is a large but irregular city, forming a sort of semicircle, partly surrounded by antient walls. Close to them flows the Arlanzon, which is crossed by three free-stone bridges leading to the suburbs, called *Vega*. Burgos has a beautiful promenade, enlivened by the intermixture of delightful gardens, constantly refreshed with fountains of water. Another promenade for the winter and a general burial ground (campo santo) have been recently added to the ornaments and conveniences of the city. Some of the streets are narrow and crooked, but others are much better, especially that leading to the cathedral. Of its numerous squares the only one deserving of notice stands in the middle of the city, and is surrounded by a piazza supported by lofty pillars, over which are some tolerably handsome houses. In the centre of this square is the statue of Charles III. There are also other statues which ornament the public places, particularly some of the fountains, with which Burgos is well supplied. The principal approach to the city is by the gate of Santa Maria, which opens on one of the bridges above-mentioned. This gate was built to commemorate the founders of the Castilian monarchy and the illustrious men who contributed to its honour and aggrandizement, with whose statues it is also adorned. Among these are Fernan Gonzalez, Charles V., the Cid, and Diego Porcelós. The best public buildings are the hôtel de ville, the palace of Velazco, and the triumphal arch already mentioned of Fernan Gonzalez, first Count of Castile. The Cathedral, a very fine and well-preserved specimen of Gothic architecture, was commenced in 1221 by Ferdinand III., whom the Spaniards call St. Ferdinand, but was not finished till some centuries after. This church is embellished with columns, statues, and other ornaments of exquisite taste, especially at the entrances called *del Perdon*, *Pellejeria*, and *Apóstoles*. It has in front two steeples, with magnificent worked spires; and the octagonal chapel called *del Condestable* is the finest part of its interior.

The climate of Burgos is damp, and one of the coldest in Spain. The manufactures are woollen cloths, stockings, baize, blankets, hats, and leather. Burgos has also two washing establishments (*lavaderos*) for wool, and most of that which is exported from Spain passes through it. The surrounding country is very beautiful. The famous monastery of las Huelgas stands at a quarter of a league, and that of Miraflores at half a league S.E. of Burgos, which is 47 leagues or 112 m. N. of Madrid. It is in 42° 20′ 59″ N. lat., 0° 0′ 10″ W. long. of Madrid, which shows how conveniently the northern road from Madrid to France passes through Burgos. (Miñano; Laborde, *Voyage Pittoresque d'Espagne; Viage de España* de Don Antonio Ponz, tom. xii. p. 19, &c.)

BURGOYNE, JOHN, supposed to be a natural son of Lord Bingley, but concerning whose youthful history we are without information, was appointed Lieut.-Col. Commandant of the 16th light dragoons in August, 1759. After serving at Belle Isle in 1761, he joined the Portuguese army under command of the Count De la Lippe in the following year, and greatly distinguished himself by surprising and capturing the town of Alcantara. Before his return to England he was promoted to the rank of colonel. In 1761 he was returned member of parliament for the borough of Midhurst, and for that of Preston in 1768. A presumed political connexion with the Duke of Grafton exposed him to the invective of Junius, by whom he was treated with great severity. He partook largely in the debates respecting the Falkland Islands in 1771, and in the following year he directed his attention to the abuses supposed to exist in the government of the East Indies. While serving as a subaltern at Preston he had secretly married Lady Charlotte, daughter of the Earl of Derby, with whom, after a time, the offending couple obtained reconciliation. This connexion first led him to write for the stage. His earliest dramatic piece, 'The Maid of the Oaks,' was written for a fête champêtre given at his father-in-law's seat (the Oaks), in June, 1774, by the Earl of Derby, in honour of the marriage of his eldest son, Lord Stanley, with Lady Betty, a daughter of the Duke of Hamilton. Lady Charlotte Burgoyne died at Kensington palace without issue, June 5th, 1776, during which year and that preceding it Burgoyne served in North America. In the summer of 1777 he was appointed to the command of a large force ordered to penetrate from Albany on the Hudson river to Canada, by the lakes. His numbers on paper were 8000 regulars, 2000 Canadians, and 1000 Indians; but of these there were never really assembled more than 7000 regulars, 150 Canadians, and 400 savages. After some success in the early part of his expedition, and the capture of Ticonderoga, he became greatly straitened for provisions, and more than one of his detachments were cut off. Having crossed the Hudson he encamped at Saratoga, about 30 m. N. of Albany. Here, in October, he was surrounded by 18,000 Americans, under Generals Arnold and Gates, who, perceiving the necessity to which their enemy was reduced, prudently declined battle, trusting to wear him out. Thus disastrously circumstanced, he opened a convention with General Gates, in which the American commander at first asserted that the retreat of the British was cut off, and proposed that they should ground their arms within their own encampments. He was answered with spirit to the first statement—that 'Lieut.-Gen. Burgoyne's army, however reduced, will never admit that their retreat is cut off while they have arms in their hands;' and to the second demand—'This article is inadmissible in any extremity. Sooner than this army will consent to ground their arms in their encampment, they will rush on the enemy, determined to take no quarter. And again, in similar language,—'If General Gates does not mean to recede from the 6th article, the treaty ends at once. The army will, to a man, proceed to any act of desperation rather than submit to that article.'

It was finally settled that the British troops should march out of the camp with all the honours of war, and should be sent to Europe on condition of not serving in America during existing hostilities. The ministry in England received the news of this convention with profound indignation, since it was chiefly owing to it that France acknowledged the independence of the United States; and the press was vigorously employed to shift the blame from the cabinet upon General Burgoyne. Both an audience with the king and a court-martial were refused; and when he defended himself in the house of commons, an attempt was made to exclude him from that assembly, under pretence that, as a prisoner of war, he had no right either to speak or to vote; but the speaker having been appealed to decided in his favour. On that occasion he voluntarily resigned all his appointments. At a subsequent period, when he was allowed to produce evidence before a committee which had been appointed to inquire into the conduct of Sir William Howe, the testimony advanced was highly in favour of his bravery and military knowledge.

On the change of ministry at the close of the American war, he was appointed Commander-in-chief in Ireland, the last of his professional employments; and he appears, on his resignation two years afterwards, to have devoted himself entirely to lighter literature. He contributed to the 'Rolliad,' the 'Ode to Dr. Prettyman,' and the 'Westminster Guide.' A comic opera, the 'Lord of the Manor,' had already appeared in 1780, and in 1786 he attempted a higher species of composition in the comedy of 'The Heiress.' Not long afterwards he adapted to the stage Sedaine's historical romance 'Richard Cœur de Lion.' His political career ended by his being appointed one of the managers for conducting the impeachment of Mr. Hastings. During the trial of Hastings, he moved and obtained the censure of the house upon Major Scott, for an attack on the conduct of the committee. He did not live till the conclusion of the trial, but was cut off by a sudden attack of the gout, on the 4th of June, 1792, and was buried privately in the cloisters of Westminster Abbey.

The dramatic and poetical works of Lieutenant-General Burgoyne were collected in two small volumes in 1808, and it is perhaps offering praise inadequate to his merits when we describe him as a very agreeable and clever writer. It would not be just to subject his lighter theatrical pieces to grave criticism, and it may be enough to say of them that after the lapse of about fourscore years, 'The Lord of the Manor' and 'Richard Cœur de Lion' still keep occasional possession of the stage; we know not indeed where to find eight lines of simpler or deeper pathos than the song 'Encompass'd in an angel's frame,' introduced into the former. Of 'The Heiress,' it is most probable that the author of 'The School for Scandal' was a diligent student, and that he borrowed and improved some of its situations and dialogue, a process by no means uncommon with Sheridan. The 'Hail to the Lyar' and 'The Westminster Guide' are inferior in point to scarcely any production in the witty volume of which they form a portion. (*Life* prefixed to his works.)

BURGUNDIANS, a people who settled in Gaul upon the downfal of the Roman empire. The origin of the name and of the people seems to be alike unknown. Plancher ('Hist. de Bourgogne') has very gravely stated and refuted the various conjectures on this head. A favourite supposition seems to have been that the Burgundians were descended from the Romans. They are mentioned by Pliny the elder, in his 'Hist. Nat.,' lib. iv. c. 28, under the name of *Burgundiones*, and he numbers them among the branches of the great stock of the Vindili or Vandals; Ptolemy places these Vindili upon the lower Vistula. The Roman historians and orators give us some intimation of their disputes and wars with the Goths, the Alemanni, and other barbarous nations. In the reign of the Roman Emperor Probus they came into conflict with the Romans; Probus defeated them and their allies, who were of other branches of the Vandals. In the reign of Diocletian and Maximian they invaded Gaul in conjunction with the Alemanni; but their unwieldy host was destroyed by famine, pestilence, and the sword. In the time of the Emperor Valentinian I. they were at variance with the Alemanni, who dwelt between the Upper Rhine and the Upper Danube, on account of some brine springs that were near the frontier of these two people, which shows that the Burgundians had moved from their seats on the Vistula to the country near the Rhine. Valentinian, desirous of humbling the Alemanni, formed an alliance with the Burgundians (Ammianus Marcellinus calls them *Burgundii*), who raised an army of 80,000 men, according to some writers, and advanced to the Rhine without experiencing any opposition from their terrified opponents. The emperor, having humbled his enemies, refused to perform his promises to his allies; and the Burgundians returned home highly disgusted with his breach of faith. In the reign of Honorius, about A.D. 406, or the beginning of 407, they invaded Gaul, like several other of the barbarous nations on the frontier, but it is doubted whether they acted conjointly. Shortly after this we find the Burgundians supporting Jovinus, who assumed the imperial purple in opposition to Honorius. The latter prince however made peace with them, and ceded to them part of Gaul, near the banks of the Rhine (or confirmed its previous cession by Jovinus), and from this cession arose the kingdom of Burgundy. About the same time the Burgundians embraced the Christian religion, at first under what is generally termed the orthodox form; afterwards they became Arians. Their kingdom afterwards increased so far as to comprehend that part of Gaul which was to the east of the Saône and Rhône (except the coast of Provence south of the Durance), Savoy, and a part of Switzerland.

Gundicarius was king of the Burgundians at the time of their settlement in Gaul. He was engaged in wars at a subsequent period with the Romans under Ætius (A.D. 435 or 436), and sustained a great overthrow from Attila (A.D. 450, or thereabout). Among his successors were Gundeuchus, and after Gundeuchus his four sons Gundobald, Godegisilus, Chilperic, and Godemar, who were said to be of Gothic extraction. Clotilda, or Clotildis, who married Clovis king of the Franks, was the daughter of Chilperic. Chilperic and Godemar dying, or being killed by Gundobald, according to Gregory of Tours (whose account is however to be received with great distrust), the remaining two brothers divided the kingdom between them, and fixed their residence, Gundobald at Lyons and Godegisilus at Geneva.

The character of Gundobald has been very unfavourably represented by Gregory of Tours; but perhaps Gregory's partiality to the Franks or his desire to win the favour of the Frankish kings influenced his judgment. Gundobald was in favour with the Romans. The emperor Olybrius bestowed upon him, A.D. 472, the title of patrician; and the usurper Glycerius rested on his support. His eloquence, his penetration, his quickness of invention, are celebrated by his panegyrists; and his tolerant spirit will be regarded in the present day as a subject of just applause. He was an Arian, perhaps the first Arian prince of his race, but he did not persecute the Catholics. Their bishops assembled without interruption, and their churches preserved their endowments. The king attended the discussions held by the advocates of the two parties on their points of difference, and kept up a correspondence with Avitus, the Catholic bishop of Vienne. He improved the laws of his kingdom, and even Gregory admits that his alterations were made with the view of rendering the condition of the old inhabitants of the country more tolerable, and of softening the barbarism of his Burgundians.

In the year 500 Gundobald was attacked by Clovis king of the Franks, whose ambition and military talents were raising the Franks to the supremacy of Gaul. Gundobald applied to his brother for aid against an enemy whom both had cause to fear. Godegisilus consequently joined him; but this treacherous brother was in secret alliance with the Franks, and in the battle which was fought near Dijon, he went over to them. Gundobald was in consequence defeated and fled to Avignon, where he fortified himself. Clovis pursued him to this city, and besieged him there; but meeting with a stouter resistance than he expected, he concluded a peace with Gundobald, on condition of a tribute, which the latter afterwards refused to pay.

In this treaty Clovis neglected to secure the interests of Godegisilus, who had by this time overrun his brother's dominions and entered Vienne in triumph. Here Gundobald came upon him by surprise, besieged the city, and having taken it, caused Godegisilus, who had taken refuge in the church of the Arians, to be put to death. From this time Gundobald reigned over the whole kingdom of the Burgundians. In the latter part of his reign he gave the Catholics reason to believe that he had embraced their views; but it is very questionable if ever he renounced Arianism; and it may be doubted if he designed anything more than to cajole the Catholic prelates, and to avert by their mediation the hostility of Clovis, who was a Catholic. Gundobald died A.D. 516.

Sigismund, the son and successor of Gundobald, had become a Catholic during his father's reign. Soon after his accession a council of bishops was held; and from the prelates who attended it, the extent of the Burgundian kingdom is inferred. Sigismund published, about A.D. 517, a collection of the Burgundian laws, which is still extant. These laws contain for the most part the original customs of the Germans, such as are found in the records of other German nations. Sigismund was twice married, and had children by each wife: by his first wife, who was daughter of Theodoric, king of the Ostrogoths of Italy, he had a son, Sigeric, and a daughter who was married to Theuderic, or Thierri, the Frankish king of Austrasia and son of Clovis. This son, upon an unjust suspicion instilled into him by the children of his second wife, he put to death A.D. 522. This act was the ruin of Sigismund. He lost his peace of mind, which he tried in vain to recover by a temporary retirement to the monastery of St. Maurice on the Rhône (which he had founded or re-established), and by other observances which the religion of the times dictated. Theodoric, king of the Ostrogoths, his surest support against the power and ambition of the Franks, was enraged at the murder of his grandson; the affections of Sigismund's own subjects were alienated; and the calamities which overtook him were regarded as judgments of heaven. In 523 Chlodomir, Clotaire, and Childebert, three of the sons of Clovis now dead, instigated by their mother Clotilda, attacked the Burgundian kingdom, to which they pretended to derive a claim by their mother. Sigismund was defeated and delivered up by his own subjects into the hands of Chlodomir, by whom he was carried to Orleans. Godomar, his brother, assumed the management of affairs, and recovered those cities which the Franks had taken. Chlodomir upon this ordered Sigismund, with his wife and some other persons, to be put to death. Godomar succeeded to the crown.

Chlodomir, having perpetrated this cruel deed, set out against the Burgundians, assisted by some troops sent to him by his brother Thierri, king of Austrasia, who had married the daughter of Sigismund, as already noticed: but he fell in battle near Vienne A.D. 524. This event retarded for a time the ruin of the Burgundian kingdom, which stood for about ten years longer. In 534 Childebert and Clotaire, sons of Clovis, and Theodebert, son and successor of Thierri king of Austrasia, made an entire conquest of it. Godomar was taken prisoner, and passed the rest of his days in captivity; and from this time the Burgundians disappear from history as an independent nation. They have indeed transmitted their name to later times, for one of the divisions of the Frankish monarchy was called from them Burgundy or Bourgogne, and the appellation has been inherited by one of the finest provinces of modern France. [BOURGOGNE.]

The Burgundians, like the other Germans, enjoyed a considerable share of political freedom. Their laws were enacted by the advice of the whole nation; and when those laws were promulgated by Sigismund, they retained their Germanic features: murder was however punished by death. They borrowed some things from the Roman laws, and the provincials who had been accustomed to those laws were allowed, at least in many instances, to retain them. When a Roman and a Burgundian happened to be at variance, a judge was appointed from each nation. The Burgundians are in their own laws distinguished by the designation *Barbari*.

The Burgundians retained their constitution under the dominion of the Franks; but they were obliged to pay tribute, and to serve them in their wars; and in the Frankish laws their subjection was made apparent by the inferior valuation of their lives. The death of a Burgundian might be atoned for by a payment of one hundred and sixty solidi, or shillings; that of a Frank for not less than two hundred. (Mascou's *History of the Antient Germans*, translated by Lediard.)

BURGUNDY. [BOURGOGNE.]

BURIAL. [INTERMENT.]

BURIATES, THE, constitute one of the three great divisions of nations into which the Mongols are divided; the two others are the Mongols themselves and the Eulith, or Calmucks. The Buriates inhabit the mountainous country inclosing the Lake of Baikal on the W. and S., from the mouth of the river Bargoosin on the E. side of the lake to the sources of the Lena on the W.; so that more than one-half of its shores are in their possession. They are also found to a considerable distance, perhaps upwards of 100 miles, from its shores.

In the form of their body they do not differ from the Mongols, and there is such a resemblance between the language spoken by these two nations that they are soon enabled to understand one another; yet the language of the Buriates is said to be much harsher in its pronunciation.

Those tribes of the Buriates which live on the N.W. shores of the Baikal lake are pagans, like the other nations of Siberia, and have adopted that kind of paganism which is called Shamanism. But the tribes which occupy the country to the S.E. of the lake have embraced the Buddhism of the Lamas. These Buriates are said to possess a literature which probably consists of theological and metaphysical writings.

A small number of the Buriates cultivate the ground, but by far the greater number live on the produce of their herds. They have numerous bodies of horses, black cattle, and sheep; also a small number of camels, which in winter time are sewed up in blankets to defend them from the effects of the intense frost. Their chief wealth consists of horses, of which they eat the flesh and drink the milk.

The Buriates have made considerable progress in some of the arts of civilized life, especially in working iron and in tanning. They are well acquainted with the art of plating iron with silver, and they have a very simple method of doing it, which is described in the travels of Georgi. The art of tanning is only practised by the women, who evince in this branch of industry great ingenuity and much taste. The women also make all the woollen stuffs which are in use among them for dresses, blankets, covers for their dwellings, &c.

As they are obliged frequently to change their places of abode to procure pasture for their herds, they have different dwellings for summer and winter; but it seems that both kinds are convenient, and well adapted to the climate and their circumstances.

Many of the Buriates are rich. On the N.W. of the Baikal they seldom possess above 100 heads of animals of all kinds, and very rarely 500 or 1000; but those to the S.E. of the lake have sometimes many thousands.

According to the most recent information the number of all the Buriates subject to Russia who are able to bear arms amounts to 73,000, which would give a population of between 200,000 and 300,000 souls. Between Selensk and Nertshinsk is the residence of the richest of their princes (called *taïshas*), who, according to Cochrane, has about 23,000 subjects. (Georgi, Pallas, Cochrane.)

BURIGNY, JEAN LE'VESQUE DE, was born at Rheims in 1692. He went to Paris in 1713, and there applied himself strenuously to philological and historical studies. After several years he went to Holland, where he engaged with De St. Hyacinthe in the compilation of a literary journal called 'L'Europe savante,' which began to appear at La Hague, in January, 1718, and was continued to 1720. It is one of the best journals of that period, and contains many interesting articles on the literature and political history of the times. The collection of 'L'Europe savante' forms 12 vols. 12mo. About one half of the papers were written by Burigny. He published also 'Traité de l'autorité du Pape, dans lequel ses droits sont établis, et reduits à leurs justes bornes,' 4 vols. 12mo., 1720, a work of close reasoning, on a subject which is very intricate and has caused much controversy among Catholics. The author professes the principles of the Gallican church, and carries them to a very great length. The questions of the subordination of the pope to the councils,—of the fallibility of the pope and of the Roman church itself, and of the consequent right of the Catholic world, in such a contingency, to choose another pastor,—of the independence of the bishops, especially in matters of discipline, &c., are all discussed at length. The 'Histoire de la Philosophie Payenne,' 1724, was afterwards re-published at Paris under the title of 'Théologie Payenne; ou, sentimens des philosophes et des peuples payens les plus célèbres, sur Dieu, sur l'âme, et sur les devoirs de l'homme,' 2 vols. 12mo., Paris, 1754. This second edition is much superior to the first, and is considered by some as Burigny's best work. Brucker wrote some critical observations on the first edition, in his 'Otium Vindelicum,' Augsburg, 1731. Burigny having returned to Paris, was made a member of the Académy des Belles Lettres. His other works are, 'Histoire Générale de Sicile,' 2 vols. 4to., 1745, a work of great research, and one of the best on the subject.—'Traité de Porphyre touchant l'abstinence des viandes,' translated from the Greek of Porphyrius, with the Life of Plotinus, 12mo., 1747.—'Histoire des Révolutions de l'Empire de Constantinople depuis la fondation de cette Ville jusqu'à l'an 1453,' 3 vols. 8vo., 1750. The last book contains a retrospect of the various controversies, ruptures, and attempts at a reconciliation between the Greek church and that of Rome.—'La Vie de Grotius, avec l'Histoire de ses ouvrages et des négotiations auxquelles il fut employé,' 2 vols. 12mo., 1752.—'La Vie d'Érasme de Rotterdam,' 2 vols. 12mo., 1757, with many interesting particulars concerning the age of Erasmus. This work was translated into German by Reiche, with additions, 2 vols. 8vo., Halle, 1782.—'Vie de Bossuet,' 12mo., 1761.—'Vie du Cardinal du Perron,' 1768. These two last biographies are considered much inferior to the two preceding.—'Lettre sur les Démêlés de Voltaire avec M. de St. Hyacinthe,' 8vo., London, 1780. Burigny wrote also a number of dissertations, which are inserted in the 'Recueil des Mémoires de l'Académie des Belles Lettres.' His learning was very extensive, and his memory excellent, but his style is cold and rather diffuse. Burigny was amiable and unpretending; he lived entirely for study, and he was much surprised when, in his old age, he learned that Louis XVI. had bestowed on him a pension of 2000 francs. He died at Paris, in October, 1785, ninety-four years of age, having preserved his mental faculties to the last. Dacier wrote his eulogy for the Academy, of which he was a member.

BURIN. [GRAVER.]

BURKE, EDMUND, was born in Dublin on the 1st of January, 1730, O. S. His father, Richard Burke, or Bourke, a Protestant, and the son of a gentleman of landed property in the co. of Cork, was an attorney in large practice. His mother was a Miss Nagle, a Catholic lady. She was, it seems, great niece of Miss Ellen Nagle, who married Sylvanus Spenser, the eldest son of the poet. Edmund, whose Christian name may possibly have descended to him from the author of the 'Fairy Queen,' was the second of three sons, who, with a daughter, were all that grew up of a family of fourteen or fifteen children.

Mr. Prior, in his 'Life of Burke' (2d edit. vol. i. p. 7), in refuting the common calumny that Burke entered political life almost a penniless adventurer, has stated that he 'received from his family at various times a sum little short of 20,000*l.*,' a fact of which he was assured from unquestionable authority, and which was frequently mentioned by the late Dr. Lawrence to Burke's friends. But the proper authority for this fact is a document which appears to have been overlooked by all his biographers. We refer to the preface or introduction, extending to nearly seventy pages, prefixed by his executors to the celebrated 'Observations on the Conduct of the Minority in the Session of 1793,' when that pamphlet was first published in an authentic form immediately after his death. This interesting statement, which reviews the whole of Burke's history, and is full of curious and valuable matter, is not found in any of the collected editions of his works, having probably been withdrawn in order that it might be incorporated in the life of him long promised by his principal executor, Dr. King, the late bishop of Rochester, which however has never appeared. The passage relating to the matter now before us is as follows:—'He was daily vilified as an obscure and needy adventurer, yet he did not tell, what he had in his hands the means of substantiating, that he was sprung from a family antiently ennobled in several of its branches, and possessing an ample estate, which his grandfather had actually enjoyed; nor that he had himself sunk a handsome competency in his adherence to his party. Once, and but once, in debate, he was provoked to declare his private circumstances. . . . . . . He said, that by the death of a brother whom he loved and lamented he had succeeded to upwards of 20,000*l.*; part of which he had spent, and the rest then remained to be spent in the independent support of his principles.' It may be observed that what is here affirmed about his grandfather havin actually enjoyed the ancestral estate is contrary to the common statement. Mr. Prior's account is, that the estate in question, which was in the county of Limerick, had been forfeited 'some time in the troubled period between 1641 and 1653,' and that Edmund's great grandfather was the first of the family who removed to the county of Cork, where he had another property, which he left to his descendants. This last estate was of comparatively small value.

Young Burke, whose health in his childhood was very delicate, being sent to live with his grandfather in the county of Cork, was first put to school at the village of Castletown Roche, where he is supposed to have remained about five years. On his return to Dublin he was sent to a school in that city; but he was removed in May, 1741, along with his two brothers, to the classical academy at Ballitore in the county of Kildare, which had been established some years before by John Barcroft and Amos Strettel, two members of the Society of Friends, and has ever since subsisted under the direction of persons of that communion. When Burke was sent there, the institution enjoyed a very high reputation under the management of Abraham Shackleton, a Quaker of superior talents and learning, who had been brought over from Yorkshire to conduct it about fifteen years before. Here Burke remained for about three years, during which time he always considered that he had acquired the most valuable of his mental habits. With Richard Shackleton, the only son of his master, and afterwards his successor in the school, he preserved an intimate friendship to the end of his life.

On leaving Ballitore Burke proceeded in April, 1744, to Trinity College, Dublin, where he does not appear to have greatly distinguished himself; but on the 26th of May, 1746, he was elected a scholar of the house. He commenced A.B. the 23rd of February, 1748, and proceeded A.M. in 1751. Meantime, having been intended for the English bar, he had entered at the Middle Temple on the 23rd of April, 1747; and in the beginning of 1750 he left Dublin for London.

Of his legal studies nothing is known with certainty; but it is probable that the attractions of literature and politics soon withdrew him from all thoughts of the law as a profession. It is believed that he became a writer in the newspapers and periodical publications almost immediately on his arrival in London. About 1752 or 1753 he is said to have offered himself as a candidate for the professorship of logic in the university of Glasgow, and to have been unsuccessful; but the whole of this story is considered very doubtful, and the records of the university do not afford the means of settling the question, as it is not the practice in elections to register any names but those of the successful candidates.[*] About the year 1755 he had formed the design of going to America, where some place under government had been offered him in one of the provinces. This project however, which he seems to have entertained for upwards of two years, he finally gave up in consequence of the opposition of his father, whom he had already displeased by his abandonment of the bar.

His first separate literary work, so far as is known, appeared in 1756, in the form of an octavo pamphlet of 106 pages, entitled 'A Vindication of Natural Society, or a view of the miseries and evils arising to mankind from every species of artificial society, in a letter to Lord * * * * * by a late noble writer.' This is—especially for a young man of twenty-six—in all respects a very remarkable production. In the first place, the imitation of the style and manner of Lord Bolingbroke, by whom the 'Vindication' affects to be written, is so skilfully managed that when it first appeared, without the preface explaining the design which now introduces it, even some persons eminent in the literary world—Lord Chesterfield and Bishop Warburton among others—are said to have taken it for a genuine production. But, without reference to its merit as an imitation, the style is throughout singularly flowing and brilliant: and indeed it would, we apprehend, be difficult to mention any piece among Lord Bolingbroke's compositions in which the same spirit and eloquence are so long sustained. The performance however is chiefly deserving of attention as indicating the peculiar direction that the mind of the author had already taken in speculating upon the subjects which he handles, and as proving how early there had been formed in it at least the germs of that philosophy of morals and of society which may be traced in all his writings and his subsequent public conduct. The following passage, containing the key to the purpose of the pamphlet, will be at once recognised by all who are familiar with his writings on the French Revolution, as identical in spirit with the whole tenor of those his latest productions; and his various speeches on the American war are all marked and pervaded by the same cast of thought, which may be defined generally as a deep sense of the incompetency of the human mind when giving itself up to speculative ingenuity, and rejecting all light and guidance from the experience of past ages, and all regard for things actually established, to cope with the complex problem of re-arranging society; and, derived from these feelings, a vehement aversion to the introduction into the practice of statesmanship of any thing appertaining to what may be called the metaphysics of social philosophy:—'The editor is satisfied that a mind which has no restraint from a sense of its own weakness, of its subordinate rank in the creation, and of the extreme danger of letting the imagination loose upon some subjects, may very plausibly attack everything the most excellent and venerable; that it would not be difficult to criticise the creation itself; and that if we were to examine the divine fabrics by our ideas of reason and fitness, and to use the same method of attack by which some men have assaulted revealed religion, we might, with as good colour, and with the same success, make the wisdom and power of God in his creation appear to many no better than foolishness.'

A few months after this pamphlet he published his 'Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful,' which however he is said to have begun when he was only nineteen. The leading doctrine propounded in this essay is, that the feeling of the *sublime* means the delight we experience whenever we have an idea of pain and danger, without being actually in such circumstances; and that the feeling of the *beautiful* means the delight that is excited in us by all such qualities in things as induce in us a sense of affection and tenderness or some other passion the most nearly resembling these, while we are yet altogether unaffected by the physical passion the object of which is the beauty of women. These views are illustrated by many ingenious and striking observations: but the spirit of the work on the whole is certainly rather critical than metaphysical. It was however very well received by the public, and immediately brought the author into much notice.

This year, Burke, having gone to Bath to re-establish his health after an attack of illness, and having there taken up his residence with his countryman and distant relation, Dr. Christopher Nugent, a physician, formed an attachment to that gentleman's daughter, and married her. Dr. Nugent was a Catholic, but his daughter had been brought up a Presbyterian by her mother, who is said to have been a very rigid one.

In April, 1757, Dodsley, who had been the publisher of the 'Inquiry into the Sublime and Beautiful,' brought out 'An Account of the European Settlements in America,' in 2 vols. 8vo., a performance of which, although it has not found a place in any collected edition of his works, there can be little doubt that Burke was the author. Indeed his receipt to Dodsley for the copy money, fifty guineas, was sold a few months ago by Evans at an auction of autographs. The work, although somewhat unequally written, is an animated and interesting sketch of American history up to the date of its publication; the general views are often ingenious and comprehensive, and the information is the result of very considerable reading. The fondness for the study of the subject of commerce, by which Burke was afterwards so much distinguished, is strongly displayed in this early production. 'My principal view,' he says in his preface, 'in treating of the several settlements, was to draw everything towards their trade, which is the point that concerns us the most materially;' and one of his remarks in the body of the work is, that whereas at the time when settlements in America were first formed by the Spaniards and Portuguese, 'the speculative knowledge of trade made no part of the study of the elevated or thinking part of mankind, now it may be justly reckoned amongst the liberal sciences, and it makes one of the most considerable branches of political knowledge.'

There is every reason to believe that Burke had already seriously determined to devote his whole strength to the attainment of political distinction. With such views he set to work vigorously to store his mind with the knowledge most necessary for an orator and statesman, making his labours as a writer for the press, as well as his private studies, subservient to this ambition. He had been for some time employed on a history of England, and this year eight sheets of the work were printed by Dodsley in quarto. But although as much more was written as brings down the narrative to the end of the reign of John, the publication was for some reason or other given up. The whole has been printed from the author's papers since his death. He soon after engaged in a work which occupied much of his attention for many years, and which indeed he is understood to have in some degree superintended to the end of his life, the 'Annual Register,' the first volume of which, for the year 1758, was published by Dodsley in June of the following year. (ANNUAL REGISTER.) For the preparation of this work, which from the first was highly successful, Burke appears to have been paid by Dodsley at the rate of 100*l.* per volume.

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[*] Communication from Glasgow.

He had now become very generally known in the literary circles of London, and also to many persons of political consequence. Among the latter was the popular Irish nobleman, the late Lord Charlemont, during a long life one of the most distinguished members of the Whig connexion in Ireland. His lordship introduced Burke in 1759 to Mr. William Gerard Hamilton, better remembered by the name of Single-Speech Hamilton. When Lord Halifax, who was Hamilton's patron, went over to Ireland as lord-lieutenant, in 1761, Hamilton accompanied him as chief secretary, and the latter offered the place of his private secretary to Burke. The offer was accepted, and Burke now returned to his native country, there to make his first entrance upon public life.

This connexion however did not last long. Burke's activity and the usefulness of his services to the government soon acquired for him much consideration; and in April, 1763, a pension of 300*l.* per annum on the Irish establishment was settled on him: but having been instrumental in procuring him this reward, Hamilton, whose nature was intensely selfish, appears to have conceived that he had thereby entitled himself to Burke's services and servility for life, as much as if he had paid him the money out of his own pocket. On discovering this, Burke immediately threw up the pension, after having enjoyed it only a year, and broke with his patron for ever.

When the Marquis of Rockingham was called to the head of affairs, on the breaking up of the administration of Mr. George Grenville, in July, 1765, Mr. Burke was, on the recommendation of several common friends, and especially, it is said, of Mr. Fitzherbert, member for Derby, appointed to the situation of private secretary to the new premier. He has himself, in his 'Appeal from the New to the Old Whigs' (written in July, 1791), given us the date of his appointment—the 17th of July, which was just a week after the nomination of the Marquis as First Lord of the Treasury. 'This July,' he says, speaking of himself in the third person, 'it will be twenty-six years since he became connected with a man whose memory will ever be precious to Englishmen of all parties, as long as the ideas of honour and virtue, public and private, are understood and cherished in this nation. That memory will be kept alive with particular veneration by all rational and honourable Whigs. Mr. Burke entered into a connexion with that party, through that man, at an age far from raw and immature; at those years when men are all they are ever likely to become; when he was in the prime and vigour of his life; when the powers of his understanding, according to their standard, were at the best; his memory exercised, his judgment formed, and his reading much fresher in the recollection, and much readier in the application, than now it is.' He was also, as soon as the houses re-assembled, brought into parliament as member for Wendover in Buckinghamshire, a borough belonging to Lord Verney. In the preface to the 'Observations on the Conduct of the Minority,' already referred to, it is said, 'He declined taking any salary for his employment under Lord Rockingham, as secretary to the First Lord of the Treasury, and at his own cost he obtained a seat in parliament.'

Subordinate as was his nominal post, Burke may be said to have become immediately the animating spirit and chief moving power of this administration. The very day he took his seat in the House of Commons, the 14th of January, 1766, he is stated to have taken part in the debate on the address of thanks, and to have been complimented on his appearance in very flattering terms by Mr. Pitt. No account of his speech however, and indeed no notice of its delivery, is given in the common report of the debate; and this is the more remarkable, as that report (which was published at the time by itself in a pamphlet, pretended to have been printed at Paris) is understood to have been in part prepared by Lord Charlemont. But there is no doubt that Burke immediately became one of the most active and efficient combatants in the ministerial phalanx. Probably no man ever entered parliament so well trained and accomplished by previous acquirements and intellectual discipline. But the natural ascendency of the man showed itself perhaps still more remarkably in the part he sustained in the out-of-doors consultations and movements of his party. The great question which the Rockingham administration was brought in to settle was that of the American Stamp Act; and the prudent and conciliatory measures by which the rising storm in the colonies was at this time allayed, are understood not only to have been originally suggested and planned by Burke, but to have been mainly indebted to his indefatigable activity, and zealous, persevering, and persuasive advocacy, for their final adoption by the various sections of the ministerial body.

When Lord Rockingham and his colleagues were dismissed on the 30th of July, 1766, Burke's pen was called into requisition to prepare such a manifesto for the public as was thought to be called for in the circumstances. This task he executed with much effect in a brief but pithy statement, under the title of 'A Short Account of a late Short Administration.'

'There are who remember,' he informs us in his 'Appeal' already quoted, 'that on the removal of the Whigs, in the year 1766, he was as free to choose another connexion as any man in the kingdom. To put himself out of the way of the negotiations which were then carrying on very eagerly, and through many channels, with the earl of Chatham, he went to Ireland very soon after the change of ministry, and did not return until the meeting of parliament. He was at that time free from anything which looked like an engagement. He was further free at the desire of his friends; for, the very day of his return, the marquis of Rockingham wished him to accept an employment under the new system. He believes he might have had such a situation; but again he cheerfully took his fate with his party.' It is understood that in the 'crossly-indented and whimsically dovetailed piece of joinery' which Lord Chatham was now endeavouring to put together, it was intimated to Burke that he might have the place of one of the Lords of Trade. It is also said that before the prorogation in July, 1767, an offer of a seat at the Treasury Board was made to him by the duke of Grafton, who, in the illness and disgust of Lord Chatham, had now become the head, or at least the nodding part, of the crazy administration. But the temptation, which had allured several of the most distinguished of his former associates, was again resisted. Up to this time it is to be remembered that the Rockingham party, although they had refused as a body to ally themselves with the ministry, had not gone into opposition. They took the latter course however in the following session, which opened in November, 1767. The parliament was dissolved in March, 1768, when Burke was again returned for Wendover.

The following year appeared his first political pamphlet, under the title of 'Observations on a late State of the Nation,' being a reply to a publication entitled 'The Present State of the Nation,' which was understood to have been written either by Mr. George Grenville, or, under his eye, by Mr. Knox, who had formerly been his secretary. From the temporary interest of much of the matter in Burke's pamphlet, it is now probably little read; although it seems to have continued in demand for a good many years, if we may judge from a fifth edition of it published by Dodsley in 1782, which is now before us. But it is a remarkably able and vigorous performance, although presenting comparatively little of that splendour of imagination which distinguishes many of the author's subsequent writings. Here again we find strongly expressed the same aversion to abstract politics which we have already described as the prevailing spirit both of his earliest and latest speculations on such subjects. Speaking for instance of the state of the Americans before the attempt made to impose internal taxes upon them by the British parliament, he says, 'In the midst of that happy enjoyment, they never thought of actually settling the exact limits of a power [that of the mother country] which was necessary to their union, their safety, their equality, and even their liberty. Thus the two very difficult points, superiority in the presiding state, and freedom in the subordinate, were on the whole sufficiently, that is practically, reconciled; without agitating those vexatious questions, which in truth rather belong to metaphysics than politics, and which can never be moved without shaking the foundations of the best governments that have ever been constituted by human wisdom.' This pamphlet has been sometimes referred to as curious, on account of a passage in which some extraordinary convulsion in France is predicted as an event to be hourly looked for, from the deranged state of the finances of that country, 'the effect of which,' it is added, 'on France, and even on all Europe, it is difficult to conjecture.' In his latest writings however Burke was accustomed to take a somewhat different view of the connection between the French Revolution and the previous derangement of the finances. For instance, in his first 'Letter on a Regicide Peace' (1796), he says, 'The financial difficulties were only pretexts and instruments of those who accomplished the ruin of that monarchy. They were not the causes of it.' The production before us is perhaps more remarkable for the progress in advance of his age which it shows the author to have made in his views on the subject of commerce. In his 'Account of the European Settlements in America,' he speaks of the errors of former times, 'when what we call the balance of trade was far from being well understood.' In the present work there is a passage respecting this same balance of trade, in which the fallacy of the common doctrine is very strongly put. He is speaking of the Newfoundland trade: 'Examine,' he says, 'our imports from thence; it seems, upon this vulgar idea of exports and imports, to turn the balance against you. But . . . your import is your own food; as much your own as that you raise with your ploughs out of your own soil; and not your loss, but your gain; your riches, not your poverty. . . . To state the whole of the foreign imports *as loss* is exceedingly absurd. . . . Even where they are not subservient to our exports, they still add to our internal wealth, which consists in the stock of useful commodities, as much as in gold and silver.' 'These considerations,' he adds, 'have been but too much neglected by most who have speculated on this subject.' Adam Smith, when he became acquainted with Burke some years after this in London, declared that he was the only man he had met with who thought as he himself did on the chief topics of political economy, without previous communication.

The pamphlet on the state of the nation was followed in 1770 by the 'Thoughts on the Cause of the Present Discontents,' perhaps the most carefully finished and the most perfect, though not the most splendid, of all Burke's writings. In the preface to the 'Observations on the Conduct of the Minority,' it is asserted that this production was drawn up at the desire of the Rockingham party: that the materials of it were collected from various conversations with all the leading members of that connexion; and that before it was sent abroad into the world the particular and distinct approbation of each was obtained. In November, 1771, Burke was appointed to the situation of Agent to the State of New York, the emoluments of which amounted to nearly 700*l.* a year. In parliament he continued to take a prominent part in all discussions, and now undoubtedly filled a larger space in the public eye than any other member of the opposition. In the session of 1772-3, nearly the whole of which was occupied in the discussion of the affairs of the East India Company, he particularly distinguished himself. In the next session a greater subject brought him still more conspicuously forward—the state of affairs in America, now, it might be said, almost in actual insurrection. On the 19th of April, 1774, he delivered his great speech, afterwards published, on 'American Taxation,' on occasion of Mr. Rose Fuller's motion for the repeal of the tea duty. On the dissolution of parliament a few months after, he was returned by the interest of Lord Rockingham for the borough of Malton; but while he was in the act of returning thanks to his new constituents, a deputation arrived from Bristol to intimate to him that he had been nominated for that city, and to carry him thither without delay. By travelling day and night he arrived at Bristol on the 6th day of the poll, and immediately proceeded to the hustings and addressed the electors. After a hard contest of twenty-seven days he was returned on the 3rd of November. On the 22nd of March, 1775, on moving in the House of Commons a series of resolutions for conciliation with the American colonies, he delivered another speech of great eloquence and power, which he also some time afterwards sent to the press. The affairs of Ireland, and especially the repeal or mitigation of the Catholic disabilities, likewise now engaged much of his attention, and were the subject of his zealous exertions both in and out of parliament. In April, 1779, he drew up an able defence of his conduct on the American question, in the form of a letter to the sheriffs of Bristol, which was immediately published. This was followed in April and May, 1778, by 'Two Letters to Gentlemen in the City of Bristol, on the Bills depending in Parliament relative to the Trade of Ireland;' another subject on which the liberal course he had pursued had given great offence to many of his constituents. On the 11th of February, 1780, he submitted in the House of Commons his celebrated plan for the regulation of the affairs of the household, the ordnance, the mint, the exchequer, the army, navy, and pension pay-offices, &c., in five bills. The admirable speech with which he introduced this plan was published, and is commonly known as his Speech on the Economical Reform. None of his other parliamentary exertions procured him so much public applause as this. Its merits however did not outweigh, in the estimation of the majority of the electors of Bristol, certain other parts of his conduct which had excited their deepest resentment, especially his support of the acts for opening the trade of Ireland, and his strenuous advocacy of the measures for relieving the Roman Catholics, which this year excited so terrible a popular ferment. The consequence was, that on the dissolution of the parliament which took place this summer, he found it advisable to decline again standing for Bristol. He presented himself however to his former constituents previous to the election in the beginning of September, and addressed them in a speech which has been published, and is one of the very best he ever delivered. He was now returned for Malton, for which borough he sat during the rest of his parliamentary life.

When Lord North and his colleagues were at last forced to resign in March, 1782, and the Rockingham party again came into power, Mr. Burke was made a privy-councillor, and appointed to the office of paymaster-general of the forces. He received the usual treatment of the highest abilities, when unsustained by any aristocratic connexion, in being excluded from the cabinet. The office of paymaster had long been the most lucrative in the state; but Burke immediately brought in a bill for its reform, by which its enormous profits were completely swept away. The annual saving to the public which his plan effected amounted to 47,000*l.*, of which not less than 25,300*l.* were the usual perquisites which all his predecessors had received. He also now carried through his other bills of economical reform, though the various interests affected by them in both houses were sufficiently powerful to mutilate them by the excision of some of their most important parts.

On the death of the marquis of Rockingham in July, and the appointment of Lord Shelburne to the head of the Treasury, Mr. Burke resigned, along with Mr. Fox and the other friends of Lord Rockingham. The success of the celebrated coalition with Lord North, however, brought him back to his former office on the formation of the duke of Portland's ministry in March, 1783. In this and the following session he took a leading part in the discussion of the affairs of India and the Company's government of that territory, a vast and intricate subject, which he had long studied, and which he was universally admitted to understand better than any other man in parliament. 'Early in his opposition to Lord North,' says the preface to the 'Observations on the Conduct of the Minority,' 'the ruling directors of the East India Company wishing to stop a popular cry, and to take from government the best plea for intermeddling in their affairs, proposed to send Mr. Burke, on his own terms, at the head of a commission to reform the abuses of the East. Some of the correspondence on this occasion is still extant. He resolved not to go, actually refused the appointment, and then, and not before, acquainted Lord Rockingham with his determination.' Two voluminous Reports, numbered the 9th and the 11th, from the select committee appointed in a previous session to inquire into the administration of justice in the provinces of Bengal, Bahar, and Orissa, were entirely prepared by him. The first, dated the 25th of June, 1783, occupies 262 pages in the octavo edition of his works; the second, which was laid before the House the same year, extends to 80 pages, exclusive of a bulky appendix of documents. On the 1st of December, he delivered another powerful speech, which he soon after sent to the press, on the motion for the House resolving itself into a committee on Mr. Fox's India Bill. When this famous measure determined the fate of the administration about a fortnight afterwards, Mr. Burke was dismissed from office with the rest of his party. He never was again a member of the government.

For some years after this the affairs of India engaged his whole 'heart, and soul, and mind, and strength.' One of the noblest of his published speeches is that which he delivered on the 28th of February, 1785, in support of Mr. Fox's motion for papers relating to the debts of the nabob of Arcot. This was followed by what have been justly called his 'Herculean labours' in the prosecution of Mr. Hastings. On the 4th of April, 1786, he presented to the House the articles of charge against the ex-governor-general; they fill two volumes of the octavo edition of his works. On the 1st of June he opened the first charge. It was not till February, 1788, that the trial began in Westminster-hall, when the impeachment was opened by Mr. Burke, in a speech which lasted four days, and was throughout a wonderful display of impassioned eloquence, and of all the resources of his rich and gifted mind. On the 21st and 25th of April, and the 5th and 7th of May, 1789, he opened the sixth charge in another speech, or rather series of orations. On the 30th of April, 1794, he presented to the House of Commons an elaborate report, filling 200 printed octavo pages, on the whole parliamentary law of impeachments, in the name of a committee which had been appointed to inspect the lords' journals in relation to their proceedings on this trial. Finally, on the 28th of May, in the same year, he commenced his concluding address on the impeachment, which continued for nine days. All these speeches have been published since his death, from notes which he spent the leisure of the last years of his life in preparing, and which he enjoined his executors to give to the world. His labours in what he was accustomed to call 'the Indian Field,' were to the close of his existence regarded by Burke as those by which he had deserved best of his country. Even in 1796, after all his warfare against the French Revolution, he writes (in his 'Letter to a Noble Lord on the Attacks made on his Pension'), 'I did not come into parliament to con my lesson. I had earned my pension before I set my foot in St. Stephen's chapel. I was prepared and disciplined to this political warfare. The first session I sat in parliament I found it necessary to analyze the whole commercial, financial, constitutional, and foreign interests of Great Britain and its empire. . . . Then, in the vigour of my manhood, my constitution sunk under my labour. . . . But in truth these services I am called to account for are not those on which I value myself the most. If I were to call for a reward (which I have never done), it should be for those in which, for fourteen years without intermission, I showed the most industry and had the least success, I mean in the affairs of India: they are those on which I value myself the most; most for the importance, most for the labour, most for the judgment, most for constancy and perseverance in the pursuit. Others may value them most for the *intention*. In that surely they are not mistaken.'

But while he was yet in the midst of his exertions in this department, another great subject suddenly called him off, which was destined to make the closing years of his life the most memorable and interesting portion of his political course. We have already had occasion to notice how early he had begun to keep an expecting eye upon the affairs of France. In a visit which he had paid to Paris not long before the accession of Louis XVI., 'he was courted and caressed,' says the Preface to the 'Observations on the Conduct of the Minority,' as a man of eminence by the literary cabal which was then preparing the way for the overthrow of altars and thrones. They daily beset him, and communicated to him enough to let a mind so observant as his into all their secrets. From that time he always dated those impressions, which made him foresee, in their first rudiments, the hideous consequences of the doctrines propagated, and the measures pursued, by the pretended National Assembly of France. Not long after his return from Paris, he took occasion, in the House of Commons, to testify those impressions. In a speech, of which no satisfactory report was ever given, but which was taken in short-hand, and of which a copy remains corrected by himself, he pointed out the conspiracy of atheism to the watchful jealousy of governments. . . . With a mind thus long before prepared, he could not be slow in forming his notions of the French Revolution. Nevertheless he sought information from every quarter, as if the subject had been wholly new to him. He desired all persons of his acquaintance who were going to Paris (and curiosity attracted many) to bring him whatever they could collect of the greatest circulation, both on the one side and the other. He had also many correspondents, not only among the English and Americans residing there, but also among the natives, to whom, as well as to other foreigners, he had always done the honours of this country, as far as his means would permit him, with liberal hospitality. Among others, he received letters, endeavouring to trick out the events of the Revolution in the most gaudy colouring, from Mr. Paine, Mr. Christie, and Baron Cloots, afterwards better known by the name of Anacharsis. It was in answer to a letter of this kind from a French gentleman that he wrote his celebrated *Reflections*.'

The 'Reflections on the Revolution in France' were published in the beginning of November, 1790. No political work probably was ever read with such avidity on its appearance, or produced so great an effect on the public mind. We have before us the sixth edition, printed before the end of the year. It is said that above 30,000 copies were sold before the first demand was satisfied.

It is stated in the preface to the 'Observations on the Conduct of the Minority,' that, on the publication of the work, 'Mr. Burke had the satisfaction of receiving explicit testimonies of concurrence and applause from the principal members of the party with whom he had begun his political career.' The opinions he had expressed, however, eventually led, as is well known, to a complete separation between himself and Mr. Fox, the then acknowledged leader of the Whigs in the House of Commons. The fullest and most minute account of the whole affair that has been published is that given in the Annual Register for 1791. To this narrative, none of the statements contained in which have ever, as far as we are aware, been contradicted, may be added the Preface to the 'Observations on the Conduct of the Minority,' to which we have so often had occasion to refer. The final contention in the House of Commons took place on the 6th of May, 1791. 'The scene altogether,' as the writers of the 'Preface' observe, 'was of the most afflicting kind.'

In the following July, Burke published an elaborate defence of the whole course of his political life, under the title of 'An Appeal from the New to the Old Whigs.' In this spirited vindication, he addresses himself especially to the attacks to which he had been subjected on the ground of the alleged inconsistency of his recent doctrines with those he had formerly maintained. 'This,' he observes, 'is the great gist of the charge against him. It is not so much that he is wrong in his book, (that however is alleged also,) as that he has therein belied his whole life. I believe, if he could venture to value himself upon any thing, it is on the virtue of consistency that he would value himself the most. Strip him of this, and you leave him naked indeed.'

We may safely venture to affirm that no person familiar with the whole series of Mr. Burke's writings can demur to the substantial soundness of the claim which he here puts forth. The soundness of his political doctrines themselves is another question: but, right or wrong, there are certainly none inculcated in his writings subsequent to the French Revolution which can fairly be said to be contradictory to those which he had maintained up to that event. His principles were altogether averse to a purely democratic constitution of government from the first. He always indeed denied that he was a man of aristocratic inclinations, meaning by that one who favoured the aristocratic more than the popular element in the constitution; but he no more for all that ever professed any wish wholly to extinguish the former element than the latter. Thus in his speech on the repeal of the Marriage Act, in June, 1781, he said, 'I am accused, I am told, abroad of being a man of aristocratic principles. If by aristocracy they mean the peers, I have no vulgar admiration, nor vulgar antipathy towards them; I hold their order in cold and decent respect. *I hold them to be of an absolute necessity in the constitution*; but I think they are only good when kept within their proper bounds.' And the work in which he may be said to have first made the profession of his political faith, his 'Thoughts on the Cause of the present Discontents,' is certainly any thing rather than a profession of democratic opinions. 'The clear object of the whole,' as is observed in the preface to the 'Observations on the Conduct of the Minority,' 'is to recommend, as the best practical government for this country, an open aristocracy of rank, property, virtue, and talents, acting in concert together, on a known and avowed system of opinions agreeable to the existing constitution of the kingdom, acquiring by their principles and conduct the public confidence of the people, and, in all those titles, claiming the public confidence of the sovereign. None of his writings on the French Revolution were ever pursued with a more violent cry than was that pamphlet, by the republicans of the day.'

The only respect in which his latest writings really differ from those of earlier date is, that they evince a more excited sense of the dangers of popular delusion and passion, and urge with much greater earnestness the importance of those restraining institutions, which the author conceives, and always did conceive, to be necessary for the stability of governments and the conservation of society. But this is nothing more than the change of topic that is natural to a new occasion. It is sufficiently accounted for and justified by what he says himself in the last sentence of the 'Reflections,' where he describes his book as containing the opinions of 'one who wishes to preserve consistency by varying his means to secure the unity of his end; and, when the equipoise of the vessel in which he sails may be endangered by overloading it upon one side, is desirous of carrying the small weight of his reasons to that which may preserve its equipoise.'

The position in which Mr. Burke was now placed had separated him in fact, though not yet altogether in form, from the political party with which he had hitherto acted. It is known however that long after this time he still continued to urge a union between the ministers and the opposition, including Mr. Fox. In February, 1793, the war with France, which he had for some years predicted as inevitable, actually broke out. About the same time the first avowed breach took place in the Whig Club, by the formal secession of Mr. Burke, Mr. Windham, and other members, to the number of forty-five in all, on the occasion of a resolution passed by the majority of the club, which was construed as a declaration on the side of Mr. Fox, in the quarrel between Mr. Burke and him.

Mr. Burke meanwhile continued his exertions both with his pen and in parliament with as much vigour as ever. The 'Appeal' had been followed in December of the same year by a paper of considerable length, entitled 'Thoughts on French Affairs,' which however was not published till after his death. A letter which he wrote about the same time to the Empress of Russia, in acknowledgment of a communication through the Comte de Woronzow of her Majesty's thanks for his book on the French Revolution, is printed among his works. But, according to the Preface to the 'Observations on the Conduct of the Minority,' it was never sent, having been suppressed by the advice of ministers, to whom it was shown, 'in consequence of some doubts which they entertained'—'just doubts,' it is added, 'as subsequent events have shown.' He also wrote, among other shorter pieces, in January, 1792, the first Letter to Sir Hercules Langrishe on the Catholic Disabilities; in November of the same year a paper entitled 'Hints for Consideration on the present State of Affairs:' in the beginning of 1793 a Letter on the subject of the Popery Laws, addressed to his son, Mr. Richard Burke, who had lately been appointed agent for the Irish Catholics; in October, 1793, his 'Remarks on the Policy of the Allies with respect to France:' and soon after, a Prefatory Discourse to his relation Mr. William Burke's Translation of M. Brissot's Address to his Constituents.

He was now however anxious to retire from public life; and an arrangement having been made for his son to succeed him in the representation of Malton, he only remained in parliament to conclude the prosecution of Mr. Hastings. Accordingly, the last day on which he appeared in the House of Commons was the 20th of June, 1794, when the thanks of the house were voted to the managers of the impeachment for their faithful discharge of the trust reposed in them. Mr. R. Burke, within a few days after his election for Malton, was taken ill, and died on the 2nd of August, at the age of thirty-six. From this severe blow his father never recovered.

The division in the Whig party had been in the mean time extending itself; and Mr. Burke's friends, the Duke of Portland and Earl Fitzwilliam, who had not thought proper to take part in the first secession, now not only left their old associates, but formally joined the ministry. Immediately after the close of the session of parliament in July, these two noblemen, with Lord Spencer and Mr. Windham, took office in the government. These arrangements are understood to have been brought about principally through the interposition of Mr. Burke. In October, 1795, he received a pension of 1200*l.* per annum on the civil list, and soon after another of 2500*l.* on the four-and-a-half per cent. fund. These grants are said to have originated in the express wish of the king.

An attack made upon him in the House of Lords on the ground of his pension, by the Duke of Bedford and the Earl of Lauderdale, drew from him, early in 1796, his celebrated 'Letter to a Noble Lord' (Earl Fitzwilliam), which was perhaps more generally read at the time, and has continued to be to a greater extent popularly known since, than anything else he ever wrote, with the exception of the 'Reflections on the French Revolution.'

His publisher on this occasion was I. Owen, of No. 168, Piccadilly, who appears to have been recommended to him by Mr. Windham. After some months, application being made to Owen for an account of the profits, he asserted that he had received the MS. as a present from the author; and rather than go to law with him, Mr. Burke chose to allow him to keep what he had got. Before this, however, Owen had obtained the MS. of another work from Burke, entitled 'Two Letters addressed to a Member of the present Parliament on the Proposals for Peace with the Regicide Directory of France.' This MS. he now refused to deliver up; and had the impudence to publish it in defiance of the author, with an Advertisement in vindication of his conduct. Meanwhile the work had been transferred by the author to Messrs. Rivington, of St. Paul's Church-yard, and was brought out by them in a correct form. In the concluding paragraph of the genuine edition, Burke speaks of the two Letters, as well as part of another which was to follow, as having been written long before. The second of these two Letters, in particular, is very remarkable for the observations it contains on the manner in which the war had till then been, and long afterwards continued to be, conducted; and for the confident tone in which it is announced that no success could be hoped for until that plan should be changed. The allies, it is observed, had adopted 'a plan of war, against the success of which there was something little short of mathematical demonstration. They refused to take any step which might strike at the heart of affairs. They seemed unwilling to wound the enemy in any vital part. . . . They always kept on the circumference; and the wider and remoter the circle was, the more eagerly they chose it as their sphere of action in this centrifugal war.' A third of the 'Letters on a Regicide Peace' was on its way through the press when Mr. Burke died. A fourth, addressed to Lord Fitzwilliam, which had been written before the three others, but never finished, was published after his death.

Early in 1797, Owen, the publisher, announced 'A Letter from the Right Honourable Edmund Burke to his Grace the Duke of Portland, on the Conduct of the Minority in Parliament; containing Fifty-four Articles of Impeachment against the Right Honourable C. J. Fox; from the Original Copy in the possession of the Noble Duke.' The publication immediately appeared, professing to be 'printed for the Editor,' and sold by Owen. There is no introductory notice, and the whole makes a pamphlet of 94 pages. This paper had in fact been sent to the press by Swift, a person whom Burke had taken into his service from motives of charity, and had confidentially employed to transcribe the only fair copy he ever had taken of it. It had been prepared in the early part of the year 1793, and communicated only to the Duke of Portland and to Earl Fitzwilliam, before they had seceded from the Whig Club. In a Letter, dated September 29th, 1793, which was sent along with it to the former, the writer says, 'I now make it my humble request to your Grace that you will not give any sort of answer to the paper I send, or to this letter, except barely to let me know that you have received them. I even wish that at present you may not read the paper which I transmit; lock it up in the drawer of your library table; and when a day of compulsory reflection comes, then be pleased to turn to it.' Swift however had surreptitiously taken a copy for his own use. As soon as the publication appeared an injunction was obtained to stop its sale; but it was notwithstanding reprinted immediately both in Scotland and Ireland, and about 3000 copies of it are supposed to have thus got into circulation. Burke was at the time at Bath, and was considered to be on his death-bed. The appearance of the paper, especially under such a title, annoyed him greatly. 'I never,' he says, in a letter which he wrote to Dr. Lawrence at the moment, 'communicated that paper to any out of the very small circle of those private friends from whom I concealed nothing. But I beg you and my friends to be cautious how you let it be understood that I disclaim anything but the mere act and intention of publication. I do not retract any one of the sentiments contained in that memorial, which was, and is, my justification, addressed to the friends for whose use alone I intended it. Had I designed it for the public, I should have been more exact and full. It was written in a tone of indignation, in consequence of the resolutions of the Whig Club, which were directly pointed against myself and others, and occasioned our secession from that club, which is the last act of my life that I shall under any circumstances repent. Many temperaments and explanations there would have been, if ever I had a notion that it should meet the public eye.'

In the end of May Mr. Burke quitted Bath for his house at Beaconsfield, in Buckinghamshire, where he died on the 9th of July. A correct edition of the paper which Owen had printed was now published by his executors, under the title of 'Two Letters on the Conduct of Our Domestic Parties with regard to French Politics, including Observations on the Conduct of the Minority in the Session of 1793.' The Letters were introduced by the important Preface to which we have so frequently referred. The 'Observations' are what had previously been published under the title of the 'Fifty-four Articles of Impeachment,' &c. The other paper is a 'Letter to William Elliott, Esq., occasioned by an account given in a Newspaper of the Speech made in the House of Lords by the Duke of Norfolk, in the Debate concerning Lord Fitzwilliam, in 1795.' His Grace, who had on the occasion referred to attacked Mr. Burke on the whole course of his recent politics, and more especially for the part he had taken in drawing off Lord Fitzwilliam from the old Whig connexion, is assaulted in turn with little mercy. The concluding portion of the Letter, which rises above personalities, is in a very high strain of eloquence.

We have mentioned in the course of this rapid sketch all the most important of Mr. Burke's writings. A collected edition of his works in 4to. was begun in 1792, and three volumes had been published before his death. Since then five more have been added, under the superintendence of his principal executor, the late Dr. Walter King, bishop of Rochester. The last appeared in 1827. A ninth volume was to contain the Life of the Author, by Dr. King; but whether or not the Life in question was ever written we are not aware. An 8vo. volume of Letters between Burke and his friend and executor Dr. Lawrence, was published in 1827. Burke's Speeches in the House of Commons, and in Westminster Hall, were published in 4 vols. 8vo. in 1816. An 8vo. volume of 'Memoirs' of Burke, 'containing many curious Anecdotes, both of a public and private nature, together with copies of several very interesting Letters from that Right Honourable Gentleman,' was announced by Owen at the end of his edition of the Letter to the Duke of Portland; but we do not know whether the book has ever appeared. There is a Life of Burke by Mr. Macormick, which we have not seen, but which we suppose to be the work described by Mr. Prior as 'a quarto volume of slander, dictated by the most envenomed party spirit, and probably meant at the moment to answer some party purpose.' Another, in two volumes 8vo., was published a short time after Burke's death, by Dr. Robert Bisset, the author of a History of the Reign of George III. By far the most accurate and complete Life of Burke however is that by James Prior, Esq., the second edition of which, in 2 vols. 8vo., appeared in 1826. There is also a very well drawn-up Sketch of Burke's Life prefixed to a handsome edition of his works, in 2 vols. crown 8vo., printed in 1834, by the Messrs. Childs, of Bungay.

BURLAMAC'CHI, FRANCESCO, a citizen of the republic of Lucca, about the year 1546 attempted a revolution in Tuscany against the Grand Duke Cosmo I., for the purpose of re-establishing the republican government. Like several of his countrymen, and other Italians of Siena, Ferrara, and other towns, Burlamacchi was secretly inclined towards the Protestant doctrines, which appeared favourable to political liberty, as their antagonist, the Papal power, supported the absolutism of Charles V. Burlamacchi held correspondence with the Protestants of Germany, who were then in arms against the emperor; and his plan seems to have been that of a general insurrection against the Papal and the imperial powers throughout Italy. With this view he had secret intelligence with the disaffected at Bologna, Perugia, and other towns of the Papal state, as well as with the Strozzi and other Florentine refugees. Being elected gonfaloniere, or chief magistrate, of the republic of Lucca, he had at his disposal nearly 2000 militia of the mountaineers of the Apennines, the captains of which were devoted to him. With this force he intended to surprise Pisa, and thus give the signal for insurrection. The plot was nearly ripe, when the indiscretion of one of the conspirators revealed the whole to Cosmo. The magistrates of Lucca, being informed of it, arrested Burlamacchi and put him to the torture, when he confessed the plot; but they refused to deliver him up to Cosmo. Ferrante Gonzaga, the imperial lieutenant at Milan, soon after demanding the prisoner, the magistrates were obliged to send him to Milan, where he was again examined under the torture, and afterwards executed for high treason. In consequence of this, some relatives of Burlamacchi and several other families of Lucca left their country, and settled at Geneva, where their descendants remain to this day. (Botta, *Storia d'Italia, continuata da quella del Guicciardini.*)

BURLAMAQUI, JACQUES JEAN, was born at Geneva in 1694, of a family, originally from Lucca, named Burlamacchi, the termination of the name having been altered according to the French orthography. Burlamaqui became professor of law in the academy or university of Geneva; and he was for a time tutor to the Prince Frederick of Hesse Cassel, with whom he resided some years in Germany. On his return to Geneva he was made Councillor of State. He is chiefly known by his work entitled 'Principes du Droit Naturel et Politique,' which was published after his death; it obtained considerable reputation, and was adapted for the use of schools. The work is written in a clear style, and is well arranged, the author having condensed what was most essential and valuable in the works of his predecessors, Grotius, Puffendorf, and Barbeyrac. Burlamaqui died at Geneva in 1748.

BURLEIGH, LORD. [CECIL.]

BURLESQUE, a word derived from the Italian adjective 'burlesco,' which is applied to qualify words, gestures, or expressions of the countenance intended to excite laughter. The Italian verb 'burlare' means to mock or mimic, and also to laugh at a person and make him a dupe. In the latinity of the middle ages we find 'burlare' used as synonymous with 'ludere.' (Ducange.) The burlesque style is applicable both to conversation and pantomime, and to written composition and the art of drawing. Facetious anecdotes and repartees exposing some blunder or turning something into ridicule are styled burlesque. The burlesque style however is most common in poetry, and may be defined to be a sort of good-humoured satire. There is a class of burlesque poems in every language, such as Hudibras and Beppo, in English; but of all modern languages the Italian abounds most in this species of composition, which is called 'poesia burlesca,' or 'poesia giocosa,' and also poesia bernesca.' [BERNI.] This species of poetry is divided into several branches, each cultivated by numerous writers both in the Italian and in the dialects of Italy. (Aldeano, *Della Poesia Giocosa.*) The burlesque in the art of drawing is shown in the English caricatures, and in the sketches of low life and merry-making exhibited by many of the Dutch and Flemish painters, and also in the representations of deformed and uncouth figures, such as are found among antient and modern sculptures. Monstrosities however, which excite a sense of horror or disgust, cannot be properly called burlesque productions, the essential quality of the latter being to excite laughter. For the same reason, satires of the invective kind reprobating gross vice, such as Juvenal's, are quite distinct from burlesque compositions.

BURLETTA (from *Burlare*, Ital., to joke, to banter, to play), a comic *operetta*, or short opera: a musical farce.

BURLINGTON, a county in the state of New Jersey, in the United States of America, extends from the Atlantic coast on the S.E. to the river Delaware and Huntingdon county on the N.W. The country is generally level and is well watered; the soil is not fertile, but nearly the whole is under cultivation. The population in 1830 was 31,066 souls.

The town of Burlington, in this county, which is not however the county town, is situated on an island in the Delaware, about 11 miles below Trenton. It was founded in 1688, and is a regularly built town with wide streets. Many of the inhabitants are engaged in the fishery, the produce of which forms a considerable branch of traffic with Philadelphia. The Camden and Amboy railway, 61 miles in length, commences at Camden on the Delaware, opposite to Philadelphia, and runs nearly parallel with the river to Burlington: it thence proceeds to Bordentown, where it leaves the river, and passing through Hightstown and Spottswood, ends at South Amboy, at the mouth of the river Rariton.

(Thompson's *Alcedo; American Almanac and Companion.*)

BURLINGTON, the county town of Chittenden county, state of Vermont, in the United States of America, is situated on a beautiful harbour on lake Champlain, near the mouth of Onion river. It stands on elevated ground, and commands a fine view of the lake and the surrounding country. It is a place of considerable trade, and nearly all the vessels which navigate the lake belong to this port.

The university of Vermont, at Burlington, was incorporated in 1791, but was not opened to students until 1800. The building, which is of brick, stands on the east side of the town, about a mile from lake Champlain, and as it is 245 feet above the surface of the water, it commands a delightful prospect. The building first raised was destroyed by fire in 1824, and has been replaced by three distinct erections, one of which contains the chapel and other public rooms, and the other two are appropriated to the lodging and accommodation of the students. The university possesses considerable endowments, consisting principally in lands. In every township in Vermont, with some few exceptions, an assignment of land has been secured to the university; only a part of this land, yielding a revenue of 2,500 dollars, has hitherto (1834) been rendered productive. There is a good medical school attached to the university. The number of students in 1833 was 50, and of alumni about 200. The annual charge to the general students for tuition and rent of apartments is 25 dollars: the expense to medical students is about 60 dollars.

There is a joint stock bank at Burlington, with a capital of 150,000 dollars; besides which the bank of the United States has an office there for discount and deposits.

The population in 1830 was 3,526. The town is 38 miles W.N.W from Montpellier, the capital of the state, and 515 miles N.N.E. from Washington.

(Thompson's *Alcedo; American Almanac and Companion.*)

BURLINGTON, EARL OF, RICHARD BOYLE, third earl of Burlington and fourth earl of Cork, was born on the 25th of April, 1695. He travelled much in Italy, where he acquired a strong love for architecture. In 1720-21, he married the Lady Dorothy Savile, eldest of the two daughters and co-heiresses of William Savile, marquis of Halifax. Charlotte, the youngest of three daughters by this lady, married the duke of Devonshire. The life of the earl of Burlington presents very few incidents. In 1730 he was installed Knight of the Garter, and in the following year he was appointed captain of the band of Gentlemen Pensioners, a post which he resigned in 1733. The title of Burlington became extinct at his death in 1753, but has since been revived.

Among his architectural works, he repaired Inigo Jones's church of St. Paul, Covent-garden, and erected at Chiswick a gateway by the same architect, which once stood at Beaufort-garden, in Chelsea. His knowledge of his favourite art was always at the command of others. He assisted Kent (whom he also maintained in his house) in publishing Inigo Jones's designs for Whitehall, and at his own expense he printed an edition of 'Fabriche antiche designate da Andrea Palladio, 1730,' a work on antient baths, from the drawings of that great architect. A country house, built by Palladio, near Vicenza, called the Villa Capra or Rotonda, furnished the idea of a house at Chiswick, which has since received large additions, and which, notwithstanding the well-known sarcasm, 'that it was too little to live in, and too big to hang to a watch-chain,' must still be considered as a model of very pure taste. Among his other works are some on his own estate at Lanesborough, in Yorkshire; the front of a house in Piccadilly (Burlington House), built by his father, and the colonnade within its court; the Dormitory at Westminster school; a house at Petersham for Lord Harrington, which afterwards belonged to Lord Carysfort; the duke of Richmond's house in Whitehall, and another for General Wade, in Cork-street. Our remembrance of the duke of Richmond's is by no means favourable, and that for General Wade, however beautiful in its elevation, was so ill distributed, that Lord Chesterfield remarked, 'Since the General could not live in it at his ease, he had better take a house over against it, and look at it.' But the Assembly-room at York is esteemed to be his *chef-d'œuvre*. The eulogy of Pope in his fourth Moral Essay, the epistle on the use of riches, which he addressed to the Earl of Burlington, is by no means exaggerated:—

> 'You too proceed! make falling arts your care;
> Erect new wonders, and the old repair;
> Jones and Palladio to themselves restore,
> And be whate'er Vitruvius was before!'

BURLOS. [Egypt.]

BURMAN EMPIRE. [Birman Empire.]

BURMAN, the name of a family much distinguished for learning. Francis Burman, son of a Protestant minister, was born in 1632, at Leyden, where he received his education. Having officiated to a Dutch congregation at Hanau in Hessen, he returned to his native city, and was nominated regent of the college in which he had before studied. Not long afterwards he was elevated to the professorship of divinity at Utrecht, where he died November 10th, 1679, having established considerable reputation as a linguist, a preacher, and a philosopher. His works, for the most part, are Commentaries on some of the books of the Old Testament, or Exercises on academical subjects.

One of his sons, Francis, was also divinity professor at Utrecht, where he died in 1719.

Another son, Peter, obtained greater reputation than either his father or his brother. He was born at Utrecht, June 26, 1668, and after his education there under Grævius and James Gronovius, he studied the law at Leyden, and travelled into Switzerland and Germany. On his return to Utrecht, he practised as an advocate, and was afterwards engaged in a public office requiring considerable attention, and married a wife of good family, by whom he had ten children. His love of classical literature, however, was so predominant, that in spite of brilliant success at the bar, he accepted the professorship of eloquence and history at the university of Utrecht, and soon afterwards those of the Greek language and of politics. On the death of Perizonius, he was translated, in 1715, to similar professorships at Leyden, and finally he was promoted to the professorship of history of the United Provinces, and the chief librarianship in the same University. He died in the 73rd year of his age, March 31, 1741. His chief works were editions of Phædrus, Horace, Petronius, Quinctilian, Valerius Flaccus, Poetæ Latini Minores, Velleius Paterculus, Virgil, Suetonius, Lucan, Ovid, and, among the moderns, of Buchanan. To these he added a collection of the Epistles of learned men, and some original Orations and Poems, a treatise ('De Vectigalibus Pop. Rom.') on the revenues of the Roman people, and a Dissertation on the Jupiter Fulgurator. A life of him, written by Dr. Johnson, first appeared in the Gentleman's Magazine in 1742.

Another Peter Burman, nephew of the last-mentioned, and son of his brother Francis, was born at Amsterdam, in 1713. He was professor of history and eloquence at Franeker, and died at Amsterdam, June 24th, 1778. He edited Aristophanes, Claudian, an Anthologia of the Latin poets, and Propertius; and he also published four books of original Latin poetry.

John Burman, son of the second-named Francis, was professor of botany at Amsterdam. He was born in 1707, and died in 1780, leaving behind him many works of celebrity on that science in their time. He is principally remembered, however, as being one of the early patrons of Linnæus.

BURMANNIA'CEÆ, a small order of endogenous plants with equitant leaves, and bright blue flowers followed by winged fruits filled with very minute seeds. They are nearly related to Iridaceæ and Hæmodoraceæ. (See Lindley's *Natural System of Botany*, 2nd edit. p. 330.)

BURN, RICHARD, the author of the 'Justice of the Peace,' and several other laborious and useful compilations, was born at the village of Winton in Westmoreland. He was educated at Queen's College, Oxford, and in 1762 the university conferred upon him the honorary degree of Doctor of Laws. He was instituted to the living of Orton in Westmoreland in 1736, which he continued to hold until his death in November, 1785. He was in the commission of the peace for the counties of Westmoreland and Cumberland, and was made chancellor of the diocese of Carlisle by Bishop Lyttleton. Dr. Burn is best known as the compiler of the 'Justice of the Peace' and the 'Ecclesiastical Law.' The first of these is an alphabetical digest of the common law and statutes relating to the duties of magistrates and parish officers, comprehending a detailed exposition of the poor-laws; and the second is an abridgment of the English system of ecclesiastical law, also disposed in alphabetical order. The materials for these works were collected by Dr. Burn with great care and accuracy, and arranged in a clear and judicious manner. Their practical utility to magistrates, country gentlemen, and clergymen obtained for them an extensive sale and a high reputation; and numerous editions of both of them have been published. Dr. Burn also compiled, in conjunction with Joseph Nicholson, a nephew of the bishop of Carlisle, a work on the antiquities of Cumberland and Westmoreland, which was published in 2 vols 4to. in 1777. He also published a history of the poor-laws, and an edition of 'Blackstone's Commentaries,' besides several sermons and works of a religious character.

BURNET, GILBERT, was born at Edinburgh, 18th September, 1643. His father, Robert Burnet, Esq., of Cremont, in Aberdeenshire, was a practitioner of law, and at the Restoration was made one of the judges of the Court of Session. The family was a younger branch of the antient house of Burnet of Leys, on which a baronetcy was conferred in 1626.

At the age of ten Gilbert was sent to college at Aberdeen, where, after having taken his degree of M.A., he proceeded to prepare himself, by the study of the civil law, for following his father's profession. He soon however gave up this study for that of divinity, and was licensed to preach, according to the forms of the Scotch church, in 1661. Although offered a living by his relative, Sir Alexander Burnet, he considered himself yet too young to undertake such a charge. In 1663 he visited Cambridge, Oxford, and London, and afterwards made a tour through Holland, the Netherlands, and part of France. On his return to England he was made a fellow of the Royal Society, which may be taken as an evidence that he already enjoyed considerable reputation.

In his own country he soon acquired also much reputation as a preacher. He had from the first adopted the practice of preaching extempore, or without writing out his discourses. In 1665 he was, on the presentation of his friend Sir Robert Fletcher, appointed minister of the parish of Saltoun, in East Lothian, on which occasion he received ordination from the bishop of Edinburgh. Here he spent nearly five years, during which, by his charity and his assiduity in the discharge of his duties, he gained the warm attachment of his parishioners. While here also he began his interference in affairs of church and state, by drawing up, in 1666, a strong representation against certain abuses of their authority, which he imputed to the Scottish bishops, and circulating it in manuscript. For this step it is said that Archbishop Sharpe proposed his deprivation and excommunication; but the other bishops did not second the zeal of the metropolitan, and nothing was done.

From 1668, when the administration of Scotland was put into the hands of Sir Robert Murray, and moderate counsels for a short time prevailed, Burnet, young as he was, began to be much consulted by those at the head of affairs. In 1669 he was chosen Professor of Divinity at Glasgow, and from this time also he became more than ever mixed up with affairs of state. Keeping to the line of moderation upon which he had set out, he applied his efforts to reconcile the dukes of Lauderdale and Hamilton, the heads of the two parties which then strove for the ascendancy; but in this attempt he had no success. About this time he is said to have refused one of the Scottish bishoprics, alleging as his excuse that he was too young. In 1669 he published his first work, entitled 'A modest and free Conference between a Conformist and a Non-conformist.' In 1670 or 1671 he strengthened his connexion with the moderate party by his marriage with Lady Margaret Kennedy, the daughter of John the sixth earl of Cassilis, designated by his contemporaries 'the grave and solemn earl,' who, after having refused to acknowledge Cromwell during all the time of the protectorate, was dismissed from office after the Reformation for scrupling to take the slavish oaths which were then administered. This lady was considerably older than Burnet.

In 1672 he published a work somewhat differing in spirit from the generality of his productions, being in fact something very like a defence of the doctrine of passive obedience, under the title of 'A Vindication of the Authority, Constitution, and Laws of the Church and State of Scotland.' In practical politics however he resisted all the attempts that were made to engage him in support of the oppressive measures of the court. In consequence he drew upon himself so much of the resentment of the duke of Lauderdale, now the ruling authority, that, in 1674, he deemed it best for his safety to resign his professorship, and to remove to London. Here, the same year, after having declined the living of St. Giles's, Cripplegate, he was made preacher at the Rolls Chapel, by Sir Harbuttle Grimstone, then Master of the Rolls; and soon after he was elected lecturer at St. Clement's. He was at the same time deprived of his honorary office of one of the chaplains royal, to which he had been appointed some years before. In 1676 he published his 'Memoirs of the Dukes of Hamilton,' which he had drawn up from the archives of the family while he resided at Glasgow. In 1679 appeared the first folio volume of his great work, 'The History of the Reformation in England,' which was received with great favour by the public, then in a very excited state on the subject of popery, and which had besides the extraordinary honour of procuring for its author the thanks of both houses of parliament. In 1680 appeared the most carefully prepared of all his writings, his tract entitled 'Some Passages in the Life and Death of the Earl of Rochester;' being an account of his conversations with that nobleman in his last illness, the result of which was the conversion of the repentant profligate to a belief in Christianity. In 1681 he gave to the world the second volume of his 'History of the Reformation.' In 1682 he published his 'Life of Sir Matthew Hale.' Overtures were now again made to him by the court, and he was offered the bishopric of Chichester by the king, 'if he would entirely come into his interests.' He still however remained steady to his principles. About this time also he wrote a celebrated letter to Charles, reproving him in the severest style both for his public misconduct and his private vices. His majesty read it twice over, and then threw it into the fire. At the execution of Lord Russell in 1683, Burnet attended him on the scaffold, immediately after which he was dismissed both from his preachership at the Rolls and his lecture at St. Clement's by order of the king. In 1685 he published his 'Life of Dr. William Bedell, Bishop of Kilmore in Ireland.'

On the accession of James II., Burnet retired to the Continent, and after visiting Paris, continued his travels throughout the South of France, Italy, Switzerland, and the North of Germany, to Utrecht. He afterwards published an account of this journey. Soon after his arrival in Holland he was introduced at the court of the prince of Orange, with whom he became a great favourite. His active exertions in preparing the way for the accession of the prince to the English throne are matter of history. When William came over to this country, Burnet accompanied him in quality of his chaplain, and immediately after the revolution he was made bishop of Salisbury.

In 1698 he was appointed preceptor to the duke of Gloucester, the son of the Princess Anne. While in Holland he had made a second marriage with Mrs. Mary Scott, a lady of Scottish descent, but of large fortune and high connection in that country. Upon the death of this lady by small-pox, he soon after made a third marriage with Mrs. Berkeley, a widow lady, of good fortune and great piety, the authoress of a work once popular, entitled a 'Method of Devotion.' The remainder of his life Bishop Burnet spent in his episcopal duties, his discharge of which was in every respect most meritorious and honourable; in attendance in parliament, in the business of which he took a considerable share, and where he continued through all changes a zealous partizan of the Whig interest; and in addressing the public with his indefatigable pen. In 1699 appeared another of his most celebrated works, his 'Exposition of the Thirty-nine Articles of the Church of England.' It excited great controversy on its first appearance, and was even condemned as heterodox by the Lower House of Convocation. An elaborate examination of the principles of the work, in so far as the point of subscription is concerned, may be found in the fourth and fifth chapters of 'The Confessional' (by Archdeacon Blackburne), pp. 57—171. In 1712 Burnet published separately his 'Introduction' to the third volume of his 'History of the Reformation,' in which having indulged himself in some very strong observations on what he considered the then alarming state of public affairs, he drew upon himself the ridicule and abuse of Swift, who retaliated for the government in one of the sharpest satires ever written, under the form of 'A Preface' to the bishop's 'Introduction.' In 1714 the third volume of the 'History' itself appeared. It is supplementary to the two former. Having now lived to see the accession of the House of Hanover, an event he had always looked forward to with anxious expectation, as the consummation of the system of national policy which he had constantly supported, the bishop died at his house in St. John's Court, Clerkenwell, London, on the 17th of March, 1715.

The most remarkable of all his works appeared soon after his death, in two volumes folio, under the title of 'Bishop Burnet's History of his Own Time, from the Restoration of King Charles II. to the Conclusion of the Treaty of Peace at Utrecht in the Reign of Queen Anne.' It was published by his son Thomas (afterwards one of the judges of the Common Pleas), who prefixed to it an account of his father's life. 'Those facts,' says the writer, 'for which no vouchers are alleged are taken from the bishop's manuscript notes of his own life, and can be supported further by other testimonies if occasion should require.' At the end of subsequent editions there is given 'A Chronological and Particular Account of the Works of the Right Reverend and Learned Dr. Gilbert Burnet, late Lord Bishop of Salisbury, corrected and disposed under proper heads, interspersed with some critical and historical observations, by R. F.' (that is, the Rev. Roger Flexman). This list contains the titles of 58 published sermons, 13 discourses and tracts in divinity, 16 tracts against popery, 26 tracts polemical, political, and miscellaneous, and 25 historical works and tracts.

Bishop Burnet's ' tory of his Own Time' was received with a cry of derision [illegible] the Tory wits. Swift wrote 'Short Remarks' on the book; Arbuthnot parodied it in 'Notes and Memorandums of the Six Days preceding the Death of the late Right Rev. ——;' and Pope in his 'Memoirs of P. P., Clerk of this P rish,' turned the garrulous and self-important manner o the writer still more successfully into ridicule. In the rem rkable one-sidedness of his party zeal, his credulousness and general want of judgment, the looseness of his style, and, as it has been observed, the still greater looseness of his facts, as well as in the too great transparency throughout the whole of 'the importance of a man to himself,' the bishop undoubtedly gave considerable provocation to these [illegible]; but still, after all deductions that can fairly be made, the 'History' is a highly interesting and valuable performance, and has preserved accounts of many curious transactions which otherwise would have remained concealed from posterity. Like everything else also that is known of the author, although it shows him to have been possessed of a considerable share of vanity and bustling officiousness, and not to have been a person of the most capacious judgment, its testimony is very favourable to the excellence of his heart and moral nature, to his disinterestedness, his courage, his public spirit, and even to his ability and talent within the proper range of his powers. Even many of his prejudices in some degree did him honour. [illegible] certainly was not in general a good writer; but besides his want of taste, he rarely allowed himself sufficient time either for the collection and examination of his materials, or for their effective arrangement and exposition. Yet, with rarely anything like elegance, there is a fluency and sometimes a rude strength in his style which make his works upon the whole readable enough.

Dryden has introduced Burnet in the third part of his 'Hind and Par ter,' in the character of the Buzzard, and sketched him personally, morally, and intellectually in some strong lines. The delineation, however, is that of a personal as well as a political enemy; for the bishop, who had little respect for poets, and who for his contemptuous mention of 'one Prior' has not unjustly been pilloried in a well-known epigram as 'one Burnet,' after the fashion of his own phraseology—had chosen in one of his pamphlets, with great recklessness of assertion, to speak of Dryden as a monster of profligacy.

The last and best edition of Bishop Burnet's great work, his 'History of the Reformation,' is that published in 7 vols. 8vo. (the index forming the last) at Oxford in 1829, with a valuable preface by Dr. E. Nares.

BURNET, THOMAS, was born at Croft in Yorkshire about the year 1635. After having been instructed at the ee school of Northallerton, he was entered at Clare Hall, ambridge, under the tuition of Dr. Tillotson. On the n of Dr. Cudworth in 1654 from the mastership of all to that of Christ's College, Burnet removed with him. He was elected fellow of Christ's College in 1657, and four years afterwards filled the office of senior proctor. On leaving the University he became to the earl of Wiltshire, eldest son of the marquess ester (soon after the Revolution created duke of with whom he travelled and gave so much n, that he was afterwards invited to accompany of Ossory, grandson of the first duke of Ormond, in capacity.

rst publication, after his return, and the work on which his fame almost exclusively rests, was in Latin, 'Telluris Theoria Sacra,' 1680. Five years after its appearance he was elected master of the Charter House. The precise date of his ordination is unknown, but at that election one of the governors objected to him that he generally appeared in a lay habit. The duke of Ormond however replied, in excuse, that he had neither living nor any other ecclesiastical preferment; and that whatever might be his mode of dress, his life and conversation were in all respects worthy of his sacred profession.

The first opposition to the dispensing power which James II. thought fit to assume, was made by Dr. Burnet about eighteen s after his election to the mastership of the Charter-house. The king addressed a letter to the governors, ordering them to admit one Andrew Popham as pensioner whenever such a place should become vacant in their hospital, without tendering to him any oath, or requiring of him any subscription or recognition, in conformity with the doctrine and discipline of the Church of England. And this was to be done notwithstanding any statute, order, or constitution of the said hospital to the contrary, with which the king was graciously pleased to dispense. In spite of the presence of Lord Chancellor Jeffries, who moved that they should proceed to vote without any debate, Burnet, who as junior governor was called upon to vote first, delivered his opinion that by ress Act of Parliament, 3 Car. I., no officer could be admitted into that hospital without taking the oaths of allegiance and supremacy. An attempt was made, but without effect, to overrule this opinion. The duke of Ormond supported Burnet, and on the vote being put Popham was rejected; and notwithstanding the threats of the king and of the popish party, no member of that communion was ever admitted into the Charter-house.

Thus barred from the hope of court preferment during the remainder of the reign of James II., Burnet employed himself in writing in Latin the second part of his theory 'De Conflagratione Mundi,' which appeared in quarto in 1689. He had already in 1684 translated the first part into English, and he added the second part in the course of the year in which it appeared in Latin; if indeed those may be called translations which he himself terms 'new compositions upon the same ground, there being several additional chapters, and several new moulded.'

On the promotion of Archbishop Tillotson, and by special recommendation of that prelate, Burnet succeeded him as clerk of the closet to King William III., and was considered to be on the sure road to preferment. These prospects however were unfortunately marred by a work which he put forth in 1692, under the title of 'Archæologiæ Philosophicæ, sive Doctrina Antiqua de Rerum Originibus.' The work was replete with learning; but the Mosaic account of the Fall was treated as an allegory, with an appearance of levity which gave offence to serious men, and of which Burnet afterwards repented. It contains an imaginary dialogue between Eve and the serpent. The cry raised against him was much increased by the unseasonable praise betowed by Charles Blount, a professed infidel, and it was thought expedient that Burnet should retire from the clerkship of the king's closet. The remainder of his days was passed in retirement at the Charter-house, where he died September

7th, 1715, and was buried in the chapel of that institution over which he had presided during thirty years.

Few works have called forth higher contemporary eul[illegible] than 'The Sacred Theory of the Earth.' It will not ind[illegible] stand the test of being confronted with the known facts of the history of the earth; and Flamsteed observed of it that he 'could overthrow its doctrine on one sheet of [illegible] that there went more to the making of the [illegible] fine-turned period.' Its mistakes arise from [illegible]herence to the philosophy of Des Cartes, and an[illegible] of those facts without a knowledge of which such an attempt, however ingenious, can only be considered as a visionary system of cosmogony; but whatever may be its failure as a work of science, it has rarel[illegible] exceeded in splendour of imagination, or in [illegible]cal conception. Burnet printed during his [illegible] few copies of a tract in Latin, 'De Statu Mortuorum [illegible]surgentium,' one of which having fallen into the [illegible] Dr. Mead was handsomely reprinted by that gre[illegible] of letters, who did not know the name of its author, [illegible] present to some few select friends. Only 25 copies [illegible] printed in quarto; Mattaire revised the text, and [illegible] many blunders by inserting manuscript notes and addi[illegible] at improper places from the author's own interleaved cop[illegible]. Upon this the executor of Burnet lent Mead a corrected copy, from which 30 were printed, with a caution to those to whom they were given not to suffer the treatise to be translated, reprinted, or published. The tract however was surreptitiously published, as well as another in Latin, 'De Fide et Officiis Christianorum.' The faulty manner in which both of these treatises were published induced [illegible] Wilkinson, a friend of the deceased author to whom his papers had come, to republish them in 1727 from Burnet's own corrected copies. To a second edition of the first tract, in 1733, is added an appendix 'De Futura Judæorum Restoratione,' which it appeared that Burnet had designed so to place.

BURNETT, JAMES. [MONBODDO.]

BURNETT, JOHN, son of Mr. W. Burnett, procurator at law in Aberdeen, was admitted advocate at the Scots bar on the 10th December, 1785, in the 21st year of his age. In 1792 he was made one of the deputies to [illegible] lord advocate of Scotland, and so continued till October, 1803, when, on the resignation of Law of Elvingstone, then at the advanced age of 90, he was appointed sheriff of the shire of Haddington. In this place he remained till April, 1810, when he was promoted to be judge admiral of Scotland, in the room of the learned R. H. Cay, deceased. He was also some time standing counsel to the city of Aberdeen. He was author of a valuable treatise on various branches of the criminal law of Scotland, which was passing through the press at the time of his death, the 8th December, 1810.

BURNEY, CHARLES, Mus. D., one of the two natives of this country to whom the world is indebted for the only complete histories of music that have yet appeared, was born at Shrewsbury, in 1726. From a few fragmentary pages of an autobiography whic[illegible] commenced, but never proceeded in, we learn that his grandfather, who prefixed a *Mac* to the family name, was 'a gentleman of a considerable patrimony at Great Hanwood, in Shropshire, who in 1727 walked as an esquire to one of the knights at the coronation of George II.;' and that his father was educated at Westminster School under Dr. Busby, but having entered into an imprudent marriage, he incurred the resentment of his parent, and thus lost to himself and descendants the property to which he otherwise would have succeeded. His wife dying, he married again; a [illegible] the object of his second choice was Mrs. Ann Cooper, a great beauty, who had rejected Wycherley the dramatic poet, the wit, the favourite of the court, the man [illegible]d and specially noticed by ladies of the highest rank—for James Burney, then seeking to establish himself as a provincial portrait painter. From this union proceeded the subject of the present article, who was unaccountably neglected by his parents, and left not only during his infancy but his boyhood, to the care of an ignorant though worthy old nurse, in the village of Condover, near Shrewsbury. At length however he was entered at the free-school of the latter place, but soon removed to the public school at Chester, in which city he also commenced his musical studies, under Mr. Baker, organist of the cathedral, and a disciple of the famous Dr. Blow. When he had attained his fifteenth year he returned to his native place, and received further instructions in the art of music, from an elder half-brother, the organist of St. Mary's, Shrewsbury. He then went to London, and was placed for a term of three years under Dr. Arne, from whom he doubtless gained some knowledge, but in a very desultory way, for the habits of that distinguished composer were by no means of a regular kind; and we have reason to believe that his pupil learnt much less from him than from the many opportunities afforded in the metropolis of hearing the best music, especially that of Handel performed under the direction of the great master himself.

In 1749 Mr. Burney was elected org[illegible] of a church in the city, and about the same period he [illegible] to take the harpsichord at a subscription concert, [illegible]d at the King's Arms, Cornhill. He was now introd[illegible] to the great actress, the idol of the theatre, Mrs. C[illegible], sister of Dr. Arne, at whose house in Scotland yard he became acquainted with most of the wits, poets, and men of letters of the day; and by his courteous manners, lively conversation, and powers of pleasing, l[illegible] the foundation of that intimacy with persons eminent for talent or elevated by birth and fortune, which proved of the utmost importance to him in after-life. This also led to his composing the music of three pieces for Drury-lane theatre—Mallet's tragedy of Alfred, Moore's burletta, *Robin Hood*, and Woodward's pantomime, *Queen Mab*. The success of the latter was remarkable; it was taught to all young ladies, set to all instruments, and played at all familiar music-parties. Nevertheless the young composer preserved a strict incognito, which his daughter, Madame D'Arblay, accounts for by supposing that as he was still under articles to Dr. Arne he 'was disfranchised from the liberty of publishing in his own name.' But from this thraldom he was emancipated by one into whose favour he had ingratiated himself, the accomplished Fulke Greville, Esq., then considered 'the finest gentleman about town,' who proposed terms to Dr. Arne for the release of his pupil, which were accepted, and Mr. Burney became an inmate in the house of his liberator, whose friendship for his *protégé* death alone dissolved. His residence at Mr. Greville's seat, Wilbury House, near Andover, was the means of much extending his intercourse with the literati and persons of rank. When Mr. Greville married Miss Fanny Macartney—the *Flora* of Horace Walpole's 'Beauties'—Mr. Burney gave the lady away: he was also the proxy of the duke of Beaufort, as god-father to the first fruits of that union, a daughter, afterwards the beautiful Mrs. (who became Lady) Crewe.

Mr. Burney was soon afterwards united to Miss Esther Sleepe, a young lady to whom he was ardently attached, and who is described by Madame D'Arblay, in language that may be excused in a daughter, as [illegible] whom the most valuable and feminine qualities, both [illegible]ntal and personal, were combined. Indeed a poem to her memory, written in elegant verse, with great and unaffected feeling, by her tenderly attached husband, and found after his decease among his papers, gives authenticity to [illegible]e substance of what Madame D'Arblay has stated, and confirms all that we have otherwise heard of Mrs. Burney's many virtues. He now settled in London, and may be said to have seriously entered on the first stage of his professional career. [illegible] when he was attacked by a dangerous illness, from which he recovered through the assistance of Dr. Armstrong, now only known as a poet. But the illness was followed by symptoms which were thought to indicate consumption, and he was earnestly advised by his physician to quit London; he therefore accepted the situation of organist at Lynn, with a salary of 100l., and resided in that town nine years. There he designed his great work, the 'General History of Music;' and there too he commenced that correspondence with Dr. Johnson which subsequently ripened into intimacy and friendship.

In 1760 his health being completely restored, Mr. Burney returned to the metropolis, and soon had his time fully occupied by his professional pursuits. Six years after he produced at Drury-lane theatre the *Cunning Man*, founded on and adapted to the music of R[illegible]seau's *Devin du Village*. In 1769 the university of Oxford conferred on him the degree of doctor in music, on which occasion he produced, as an exercise, an anthem, which was afterwards performed in Germany under the direction of the famous Emanuel Bach. His primary object however was his *History*; and as he found that much of the materials for this could only be obtained by a personal examination of the great libraries of Europe, and by conversation with some distinguished professors on the continent, he set out from London in June, 1770, amply supplied with letters from the earl of Sandwich to the several English ambassadors and accredited agents abroad. He visited Paris, where, at the English ambassador's table, he first became acquainted with David Hume. At Geneva he had an accidental interview with Voltaire. Thence he proceeded to Turin, and all the principal cities of Italy, hearing and reading everything connected with his inquiry. Of this tour he gave an account in his 'Present State of Music in France and Italy,' a work, the arrangement of which was professedly imitated by Dr. Johnson, in his 'Tour to the Hebrides,' who emphatically said, 'I had the Musical Tour of that clever dog, Burney, in my eye.'

In the year 1772, Dr. Burney proceeded again to the continent. In order to complete his inquiries, he found it expedient to visit the Netherlands and Germany. At Vienna he formed an intimacy with Metastasio, and became acquainted with Hasse and Glück. From the capital of the Austrian dominions he went by Prague, Dresden, and Berlin, to Hamburg. In the latter city he passed a great deal of time with C. P. E. Bach, from whom he gained much interesting information concerning the numerous and celebrated family of harmonists, and relative to other objects of his inquiry.

In 1773 Dr. Burney was elected a fellow of the Royal Society.

The first volume of the *History of Music* appeared in 1776; the second in 1782; and the third and fourth in 1789. The Commemoration of Handel in 1784, an event of too much importance to remain imperfectly recorded, likewise employed Dr. Burney's pen. At the desire of his friend the earl of Sandwich, he wrote an account of those celebrated performances, including a good Life of Handel. In 1789 he was appointed, by his friend Edmund Burke, organist of Chelsea college, an office which he accepted rather for the sake of airy and desirable apartments, which he was in consequence enabled to obtain, than with a view to the trifling emolument arising out of it. In 1796 he produced a *Life of Metastasio*, in three octavo volumes, a work written in an admirable style, displaying great candour and taste, and highly interesting to the lovers of the lyric drama and music; though many of the poet's letters to his friend Farinelli, the once far-famed soprano, might have been spared. His last literary effort was his contribution to the Cyclopædia of Rees, for which he supplied all the musical articles, except those of a mathematical character. The remuneration of this final labour was 1000*l.*, a sum which does not seem inadequate, when it is considered that much of the matter was extracted from his own *History of Music*.

During the whole of his life, Dr. Burney's high Tory principles were openly avowed, though the party never exerted their influence in his favour; but when the Whigs came into power, in 1806, Mr. Wyndham, backed by Mr. Fox, obtained for him a pension of 300*l.*, a grant which, it has been well remarked, 'was more justly obtained in this instance than in nine cases out of ten in which the royal prerogative has been exercised.' This solid proof of his country's esteem was followed, four years after, by a testimony to his merits of the most honourable kind, and the more flattering because proceeding from a government to which he never concealed his enmity—the National Institute of France elected him one of its members, a dignity then never conferred on any but persons whose claim was recognised by all the *savans* of Europe.

From that period Dr. Burney relinquished every pursuit which called for much intellectual effort; he passed the whole of his time in the society of his family and friends, by all of whom he was beloved and admired. But by almost imperceptible degrees his bodily strength diminished, though his mental vigour continued unimpaired, as the writer of this article had many opportunities of witnessing. The severe winter of 1814 produced a visible and alarming effect on his enfeebled frame; and though the return of spring revived the hopes of those who with affectionate solicitude watched the state of his health, yet it soon too clearly appeared that nature was exhausted. On the 15th of April he tranquilly expired, at his apartments in Chelsea college. His remains were deposited in the cemetery of the college, and attended to the grave by the several members of his own family, together with a numerous list of persons distinguished by birth, station, and talent.

Several compositions by Dr. Burney were published at different periods, but posterity will only view him in his literary and critical character, in which, it is by all agreed, he attained a very high rank. 'In all the relations of private life,' says one who knew him well, 'as a husband, a father, a friend, his character was exemplary. His manners were peculiarly easy, spirited, and gentlemanlike. He possessed all the suavity of the Chesterfield school, without its stiffness: all its graces, unalloyed by its laxity of moral principle.' (*Harmonicon*, xi. 216.)

Dr. Burney left two sons and four daughters by his first wife; and by a second wife—Mrs. Stephen Allen, of Lynn, a widow—one daughter. He lived to be rewarded for his care and judgment in the education of his children, by witnessing their prosperity; and our account of so eminent a person would be incomplete were we to pass unnoticed those of his progeny who rendered themselves conspicuous by superiority of intellect and activity of pursuit; and here we shall quote again from the work above cited: 'His eldest son, James, entered early in life into the naval service, and accompanied Captain Cook in his second and third voyages round the world. he afterwards commanded the Bristol 50-gun ship on the East India station, where he for some time acted as commodore; and having attained the rank of rear-admiral, died in 1821, in his 71st year. He is known also as the author of many judicious tracts, but more particularly by a most able and laborious *History of Voyages of Discovery in the Southern Ocean*, in five quarto volumes. Dr. Burney's second son, the Rev. Charles Burney, D.D., rector of St. Paul's, Deptford, who survived his father only three years, was one of the most learned and accomplished scholars and able critics, more especially in Grecian literature, of his day. His library was, at his death, purchased by the nation at the expense of 14,000*l.*, and placed in the British Museum. The novels—*Evelina*, *Cecilia*, &c.—written by his second daughter, Madame D'Arblay, formed a new era in that species of composition; and although the manners pourtrayed in them by so lively a pen are now nearly obsolete, the vivacity of style and variety and discrimination of character are such, that they are still sought after, and read with delight and improvement. A still younger sister followed the track of Madame D. with considerable, though not equal, success.'

BURNING. [BRAND.]

BURNING GLASSES and MIRRORS. Any lens of the convex kind, or mirror of the concave kind, which collects a quantity of light within a very small space, will, if the light be very strong, such as that of the sun, also collect a considerable quantity of heat, which will set fire to many substances; or, if the glass have an aperture of some size, almost any substance whatsoever. This property has been very long known. The last proposition of the treatise on catoptrics attributed to Euclid is, 'By concave *mirrors* placed opposite to the sun, fire may be kindled;' and the reason is explained, namely, the condensation of the sun's rays. In the 'Clouds' of Aristophanes (766, &c.) Strepsiades tells Socrates that he has found out an excellent way of cancelling his debts, namely, by standing at a distance from the lawyer who is drawing up the case against him, and destroying the writing by catching the sun's rays in such a burning-glass or transparent stone as people kindle fire with. We may see in ARCHIMEDES that the stories relative to his burning the Roman fleet by mirrors are of comparatively modern authority. From the end of the seventeenth century various experiments have been made with glasses of considerable power; but as no very important results followed, beyond the establishment of the very great effect which may thus be produced, the subject has become of very little importance. We shall however, referring the reader to LENS and MIRROR for all stricter notions upon the subject, state some facts connected with burning glasses in a more popular shape.

It is found that heat alone without light passes very slowly through glass; that even with ordinary light very little heat is transmitted through glass; and that it is only with the full glare of sun-light that any sensible effect can be produced. If a convex lens be held directly opposite to the sun, and allowed to throw an image on a sheet of paper held behind and parallel to it, and if the sheet of paper be moved until the image of the sun thrown upon it appear smallest, the quantity of light transmitted through the glass, which remains the same throughout, is then thrown upon the smallest quantity of surface, and presents the greatest condensation of light and heat which the glass will afford. The same phenomenon would be perceived in a concave mirror, with this defect, that the surface which is held before it must intercept a part of the light.

Two glasses were made by Tschirnhausen, before 1699, which are among the earliest of the attempts to produce considerable effects; the first of 33 inches diameter and 7 feet focal length, the second of the same diameter and 12 feet focal length (old Parisian measure). A second lens received the rays and diminished the focal distance The effect was to burn small portions of wood, or boil water, also in small quantities, in one moment; to melt small pieces of metal, to vitrefy slate, &c.; to melt pitch and rosins under water. But the most complete effect was produced from a lens made by M. de Trudaine, about 1774, which did not consist of glass alone, but was a hollow lens of glass, filled first with spirits of wine, which was afterwards changed to terebinthine oil. It held 140 pints (Parisian), and filled with the latter substance had about 11 feet of focal length. According to M. Brisson (afterwards cited), who made the experiments, a bar of steel, four inches long and a third of an inch square (Parisian), was completely melted in five minutes. A silver coin of three livres was melted in a few seconds, and one of six livres in nearly the same time; grains of platinum were sufficiently melted to cohere, though not to form a spherical drop.

M. Buffon, remembering the story about Archimedes, endeavoured to form mirrors which should burn at a great distance. The disadvantage of trying to gain power by increasing the aperture lies in the great relative increase which is thereby given to the small image of the sun No *spherical* glass or mirror refracts or reflects rays accurately to a point. The plan of M. Buffon was to make his mirror consist of a large number of small plane mirrors, 400 in number, so placed that they should all reflect their several images of the sun on the same point. He thus burnt wood at 200 (French) feet distance, melted tin at 150 feet, and lead at 140 feet. [BUFFON.]

The only practical application of the burning glass (if it deserve so dignified a name) of which we ever heard is at Paris (or was). A burning-glass is placed in such a way that the sun shall throw its image into the touch-hole of a small cannon, at its greatest height, which thus explodes within a minute or two of noon, if there should happen to be no cloud in the way.

Those who desire more particular information may consult Young's *Lectures on Natural Philosophy*, vol. ii. p. 406, for a list of works; and also Brisson, *Dict. de Physique*, articles 'Miroir' and 'Verre ardent'; and Dr. Hutton's *Math Dict*, article 'Burning-glass.'

BURNLEY, a market town and chapelry, in that part of the extensive parish of Whalley which is in the higher division of the hundred of Blackburn, in the county palatine of Lancaster. It is 211 miles N.N.W from London, 25 N from Manchester, 53 E.N.E. from Liverpool, 12 N.E. from Blackburn, and 11 S.E. from Clitheroe.

The town is pleasantly situated, chiefly in a narrow vale, forming a tongue of land on the banks of the Brun or Burn, from which it derives its name, about a mile and a half above the confluence of that river with the Calder. Its pop., which now amounts to 7551 inhabitants, has rapidly increased since the commencement of this century, as the decennial census exhibits during that period:—1801, 3305; 1811, 4368; 1821, 6378; 1831, 7551. According to the two last assessments for the county rate, the annual value of the land, messuages, and other buildings in the township shows a corresponding augmentation. In 1815 the annual value was returned at 8,643*l*., and in 1829 at 15,879*l*.

The boundaries of the chapelry include Burnley township, 7551 inhabitants; Habergham Eaves township, 5817 inhabitants; Briercliffe with Extwistle township, 1755 inhabitants; and Worsthorn township, 798 inhabitants; making a total population of 15,921.

The name of this town is not found in the ancient itineraries. There have been however so many remains of Roman antiquities—coins, pottery, and urns containing ashes and calcined bones—discovered about the place, that Dr. Whitaker's conjecture of its having been a settlement upon a public way, between Ribchester and Cambodunum, lying, as it does, in a straight line between those two places, seems to be well founded. Some Saxon remains have also been found; and at a small distance E. of the town, is a place called *Saxifeld*, which tradition has marked as the scene of a battle in the times of the heptarchy. Adjoining the town and near the church is a cross which is supposed to commemorate the preaching of Paulinus, the first Christian missionary in these parts, about the year 597, and to indicate the spot on which the inhabitants assembled for religious worship prior to the erection of the church.

Though an old town, the greater part of Burnley is of recent erection, and the houses are chiefly built of freestone which is found in the neighbourhood. During the last few years considerable improvements have been made, under an act obtained in 1819 for that purpose: the town has been lighted with gas, the streets have been well paved and the foot-paths flagged, and excellent waterworks have been established, supplied from two elevated reservoirs, one to the N. and the other to the S. of the town. The barracks in the adjoining township of Habergham Eaves were erected in 1819, at a cost of 5500*l*., of which sum 2500*l*. was raised by voluntary subscription. The workhouse stands in Rayle Road.

The trade of Burnley was formerly confined to woollens but the cotton manufacture is now the staple of the place. On the two rivers around the town there are extensive establishments for spinning and weaving cotton and printing cloth, besides several mills for grinding corn, and one for fulling cloth. In other parts of the town are brass and iron foundries, machine shops, bleach-works, roperies, tanneries, and breweries. The Leeds and Liverpool canal, which nearly surrounds the town, opens a communication for the conveyance of goods through the whole line of country, from the German Ocean to the Irish Sea. Coal, freestone, and slate are found in abundance close at hand and in the vicinity: some veins of lead have also been discovered.

The government of the town is vested in a constable, annually chosen. Four magistrates, who act for the hundred, hold a petty sessions every Monday, and meet in rotation, generally two at a time. The charter for the market was granted in the 22nd of Edward I. to Henry de Lacy, Earl of Lincoln, to be held on Tuesday: but that day has been changed to Monday and Saturday. Fairs are held on March 6th, Easter eve, May 9th and 13th, July 10th, and October 11th. There has also been since 1819 a fair for fat and lean cattle, on every alternate Monday. The annual wool-fair is held on the second Thursday in July, and the fair for horses on the third Thursday in October.

The parochial chapelry of Burnley, dedicated to St. Peter, was one of the three churches existing in the parish of Whalley in the reign of Henry I.: but nothing remains of the antient structure, which was built soon after the Conquest. The present edifice has undergone much alteration: it had originally four chantries, namely, the rood altar, placed upon the rood-loft at the entrance of the choir, now removed; the altar of St. Peter; the altar of St. Mary; and the altar of St Anthony. It is a spacious structure; but having been rebuilt and enlarged at different times, it combines various styles of architecture. At the E. extremity of the S. aisle is the Stansfield choir, in which there is an antient grave-stone with a cross fleury and sword; and at the E. end of the N. aisle is the chapel of the Virgin Mary, the property and burial place of the Townley family: it contains some shields of arms, and a monument to the memory of Charles Townley, Esq., whose collection of marbles is now in the British Museum. The living is a perpetual curacy in the archdeaconry and diocese of Chester, endowed with benefactions which make it the best curacy in the kingdom. In the reign of Edward VI. the incumbent of Burnley 'had for his wages yearly the sum of 4*l*. 8*s*. 11*d*.' as appears from 'an inquisition' taken at Manchester in 1683; but now, from various donations aided by Queen Anne's bounty, it amounts to upwards of 500*l*. per annum. Forty-eight acres of glebe land are attached to the chapelry. The living is in the gift of Robert Tonwley Parker, Esq. of Cuerdon Hall, near Preston. There are places of worship belonging to the Baptists, the Roman Catholics, the Wesleyan Methodists, and the Independents. These places of worship have Sunday-schools attached to them, in all of which the children of different religious denominations are received and instructed.

The free grammar-school is in North Parade. A part of the chantry of St. Mary on the W. side of the churchyard was formerly used as a school-house, until 1695, when the present building was erected. It is supposed to have been founded in the reign of Edward VI. The endowments of the foundation amount to about 140*l.* per annum, which forms the salary of the head master, who teaches the classics and exercises a general superintendence over the lower school. In this school English, writing, accounts, and practical mathematics are taught by an assistant, who is remunerated by a charge of three guineas a year, which is allowed to be made to the scholars. Two guineas a year is the sum charged for the sons of persons in humble life. The average number of scholars is about sixty, of whom ten or twelve are instructed in the classics. The school has an interest in thirteen scholarships founded in Brasenose College, Oxford, by Dr. Nowell, Dean of St. Paul's, London, in 1572. The master is appointed by the trustees of the land belonging to the school. In a room over the school is a valuable library, left by the Rev. Henry Halsted, rector of Stansfield, for the use of the scholars. The Rev. Dr. Whitaker, the learned master of St. John's College, Cambridge, and the historian of the 'original parish of Whalley,' received his early education in this school.

There are also five national schools in the chapelry, in which nearly 2000 children receive the rudiments of education, and are instructed in the principles of the established church: these are supported by subscription. In the same manner also is supported a charity for poor married women in childbed; and a Strangers' Friend Society. Other charities, to a considerable amount, are distributed annually among those for whose benefit they were intended: Madam Isabel Shirburne's, 9*l.* for the use of the poor; Robert Halsted's, a moiety of *5l. 7s.*, for the same purpose; Mrs. Elizabeth Peel's, 22*l.* 10*s.* for clothing the poor, Mrs. Mary Hindle's, 20*l.* 5*s.* for relieving old and infirm poor persons; Mrs. Hargreave's, 9*l.* for clothing poor and infirm widows.

Burnley is one of the places appointed under the Boundary Act for taking votes at the election of knights of the shire for the N. division of the county. (*Communication from Lancashire.*)

BURNS AND SCALDS. Burns are produced by heated solids; scalds by heated fluids. The severity of the injury is dependent mainly on the intensity of the heat of the burning body. Fluids are not capable of acquiring so high a degree of temperature as some solids; hence the immediate effect of scalds is generally less violent than that of burns. But, on the other hand, fluids flow about with great facility, and the accident often causes a very large surface of the fluid to be thrown upon the body, so that a scald which produces only a moderate degree of inflammation sometimes becomes exceedingly severe on account of its extent. As heated fluids part with their caloric in being diffused, a scald is almost always attended with a different degree of injury in different parts of its course. The extent of the surface involved, the depth of the injury, and the sensibility of the part affected, must all be taken into account in estimating the danger of the accident in any given case. A burn which produces the instantaneous death of the part it touches may be free from all danger if the injured part be circumscribed within a small compass. The worst burns which occur arise from the explosion of gunpowder, or of inflammable gases, or from the female dress catching fire; and the worst scalds from the boiling over of heated fluids in breweries, manufactories, laboratories, &c.

The immediate seat of the injury produced by burns and scalds is the skin, which is a highly organized membrane, performing a very important organic function, and endowed with a high degree of sensibility. The organic function performed by it is the secretion of a quantity of aqueous fluid from the blood, which is carried out of the system under the form of perspiration. [Perspiration, Cutaneous.] The secretory arteries of the skin are excited to such an unusual degree of action by the stimulus of the heated body, that they pour out an aqueous fluid in such quantity as to lift the cuticle from the cutis or true skin [Skin], and form a vesicle or bladder full of fluid. Such is the violence done to the true skin, that the function of all the injured portion of it is suspended; additional labour must therefore be imposed on some other organ, which must be its substitute and perform its work, otherwise a fatal disturbance will take place in the system. The lung exhales the same aqueous fluid as the skin. [Transpiration, Pulmonary.] In proportion as the cutaneous perspiration is diminished, the pulmonary transpiration is increased; but when a large extent of the skin is destroyed, the lung is inadequate to the task imposed upon it; it cannot perform its own work and that of the skin also, and in this case great difficulty of breathing invariably comes on, and the danger is exceedingly increased by this oppression of the lung.

But there is spread over the external surface of the true skin an immense number of sentient nerves, rendering it an organ of sense. A burning body applied in such direct contact with the sensitive extremities of these nerves occasions violent pain; and this, in consequence of the sympathy which is established between all parts of the body, produces a great disturbance of the system. The abolition of the organic function, and the disturbance occasioned to the sentient part of the nervous system, both combined, often prove fatal.

Since the severity of the injury must always be mainly in proportion to the length of time the burning body continues in contact with the skin, it is important that every one should impress upon his mind the course which it is best to take in case of accidents from burns.

The upright posture is obviously not only favourable to the spreading of the flames, but to their reaching the more important parts of the body, the neck and head. Any motion of the body to and fro gives great advantage to the flames, by bringing fresh currents of air into contact with the burning materials, and it is therefore utterly absurd to run screaming about. Fall upon the floor; keep rolling over and over upon the carpet; if possible seize the hearth-rug, or the table cover, and, enveloping the body in it, keep rolling about upon the carpet until assistance comes. The duty of the assistant is to seize the hearth-rug, or the table-cover, or a shawl, or to strip himself of his coat, or to seize any woollen or flannel clothing at hand and to envelope in it as closely and completely as possible the person on fire.

The thing to be done with the burnt or scalded parts is instantly to immerse them in cold water, ice-cold if it can be got. Should the position of the parts not allow of their immersion in water, cloths should be applied to them dipped in water, and kept constantly wet. As a means of applying and retaining cold, scraped potatoes or turnips are useful. Some persons recommend, instead of those cooling applications, stimulating substances, such as the strongest brandy, spirits of wine, oil of turpentine, or vinegar, kept on the affected parts by means of old linen or lint soaked in the fluid. The use of these applications, whether the cooling or the stimulating, should be persisted in until the pain ceases; the parts should then be dressed, as some recommend, with the yellow basilicon ointment, softened with the oil of turpentine; or, as others prefer, with emollient poultices often renewed. It is singular that, common as this piece of surgery is, practitioners are not agreed which of these two plans, the cooling or the stimulating, is the most efficient; and comparative trials have not yet been made on a scale of sufficient extent to determine the question. It is probable that the one may be more advantageous than the other under different circumstances, which the unprofessional person cannot be expected to discriminate. All that is necessary to be stated here is the most judicious thing to be done, in the very first instance, until professional assistance can be procured; and with this view, perhaps, the only thing that should determine the choice between either of the cooling or stimulating articles just mentioned is the facility with which they can be got. It is probable that the chief effect of all these applications is to prevent the air from coming into contact with the true skin; that is, to perform the office of the cuticle which is destroyed. Accordingly, some of the most distinguished surgeons state that they have produced the very best effects by merely covering the affected parts with old linen saturated with oil, by which the air is effectually excluded. On this ground it is probable that a remedy, occasionally recommended, will prove in practice as useful as any, namely, enveloping the part in cotton; and if so, it will be better than any, both on account of its lightness, and from the ease with which every mistress of a family can always have abundance of it at hand.

BURNS, ROBERT, was born on the 25th of January, 1759, in a small cottage about two miles to the S.W. of the town of Ayr. His father, William Burness, was the son of a farmer in Kincardineshire, but in consequence of the reduced circumstances of his family he had left that part of Scotland in his youth to seek employment in the South as a gardener. After serving different masters for a number of years, he had on his marriage in December, 1757, taken a perpetual lease, or feu, as it is there called, of seven acres of land, with the view of setting up for himself as a nurseryman. Here he built with his own hands the humble dwelling in which Robert, his eldest son, was born.

The history of the poet's early life has been very fully related both by himself and by his brother Gilbert. The narrative of the latter, in particular, is one of the most beautiful and touching ever written. The life of William Burness was one continued struggle, which he carried on with the honourable pride common among his countrymen to better his circumstances, and to give his children a good education. Robert was first sent to a school about a mile distant, in his sixth year. Afterwards a young man was engaged by William Burness and four of his neighbours to teach their children in common, his employers boarding him in turns. When they had removed to another situation, which precluded them from this advantage, the good man, after the hard work of the day, endeavoured to instruct his children himself. 'In this way,' says Gilbert, 'my two eldest sisters got all the education they received.' Robert obtained a little more school instruction by snatches, but the amount altogether was very inconsiderable. His chief acquisition was some acquaintance with French, and for this he was almost entirely indebted to himself. What other knowledge he obtained he gathered from the few books, mostly odd volumes, which his father could contrive to borrow. At last, in the beginning of the year 1784, William Burness died, worn out with toil and sorrow, after living just long enough to learn that a law-suit in which he was engaged with his landlord had been terminated by a decision which involved his family in ruin He left five children younger than Robert and Gilbert.

In these circumstances, the youth and early manhood of the future poet were dark enough. 'The cheerless gloom of a hermit,' he says himself, 'with the unceasing moil of a galley-slave, brought me to my sixteenth year.' His brother Gilbert writes, 'To the buffetings of misfortune we could only oppose hard labour, and the most rigid economy. We lived very sparing. For several years butchers' meat was a stranger in the house, while all the members of the family exerted themselves to the utmost of their strength, and rather beyond it, in the labours of the farm. My brother, at the age of thirteen, assisted in threshing the crop of corn, and at fifteen was the principal labourer on the farm, for we had no hired servant, male or female. The anguish of mind we felt, at our tender years, under these straits and difficulties, was very great . . . . I doubt not but the hard labour and sorrow of this period of his life was in a great measure the cause of that depression of spirits with which Robert was so often afflicted through his whole life afterwards.' Some time before their father's death, and when his affairs were drawing to a crisis, the two brothers had taken another farm, which they stocked in the best way they could with the savings of the whole family. 'It was,' says Gilbert, 'a joint concern among us. Every member of the family was allowed ordinary wages for the labour he performed on the farm. My brother's allowance and mine was 7*l.* per annum each. And during the whole time this family concern lasted, which was four years, as well as during the preceding period at Lochlea, his expenses never in any year exceeded his slender income . . . His temperance and frugality were everything that could be wished.'

A little before his sixteenth year, as he tells us himself, he had 'first committed the sin of rhyme.' His verses soon acquired him considerable village fame, to which, as he made acquaintances in Ayr and other neighbouring towns with young men of his own age, he greatly added by the remarkable fluency of his expression, and the vigour of his conversational powers. The charm of those social meetings, at which he shone with so much distinction, gradually introduced him to new habits. Yet his brother affirms that he does 'not recollect till towards the end of his commencing author (when his growing celebrity occasioned his being often in company) to have ever seen him intoxicated.' His attachment to female society, also, which had from his youth been very strong, was now no longer confined within those 'bounds of rigid virtue,' says his brother, 'which had hitherto restrained him. Towards the end of the period under review (in his twenty-fourth year), and soon after his father's death, he was furnished with the subject of his "Epistle to John Rankin."'

Another affair of this description soon after determined the whole subsequent course of his life. This was his connexion with Jean Armour, afterwards Mrs. Burns, the fruit of which was the birth of twins. In the difficulties and distress to which both parties were reduced by the consequences of their imprudence, it was agreed between them that they should make a legal acknowledgment of an irregular and private marriage, and that he should then set out for Jamaica to push his fortune. 'But before leaving my native country for ever,' he says, 'I resolved to publish my poems. I weighed my productions as impartially as was in my power: I thought they had merit; and it was a delicious idea that I should be called a clever fellow, even though it should never reach my ears.' An impression of 600 copies of the book accordingly was printed at Kilmarnock. This was in the autumn of 1786. The poems were well received by the public; and after paying all expenses the author cleared nearly 20*l.* 'This sum,' he says, 'came very seasonably, as I was thinking of indenting myself, for want of money to procure my passage. As soon as I was master of nine guineas, the price of wafting me to the torrid zone, I took a steerage passage in the first ship that was to sail from the Clyde, for "hungry ruin had me in the wind." I had been for some days skulking from covert to covert, under all the terrors of a gaol, as some ill-advised people had uncoupled the merciless pack of the law at my heels.' This was to oblige him to find security for the maintenance of his children: for the parents of the mother were so indignant, that, notwithstanding what had happened, they would not allow the marriage to take place, and the children to be legitimatized. He proceeds: 'I had taken farewell of my few friends; my chest was on the road to Greenock; I had composed the last song I should ever measure in Caledonia, "The gloomy Night is gathering fast," when a letter from Dr. Blacklock to a friend of mine overthrew all my schemes, by opening new prospects to my poetic ambition. The Doctor belonged to a set of critics, for whose applause I had not dared to hope. His opinion that I would meet with encouragement in Edinburgh for a second edition fired me so much, that away I posted for that city, without a single acquaintance, or a single letter of introduction.'

The result was the introduction of the poet to all who were eminent in literature, in rank, or in fashion, in the Scottish metropolis. The brilliant conversational powers of the unlettered ploughman seem to have struck all with whom he came in contact with as much wonder as his poetry. Under the patronage of the Earl of Glencairn, Dr. Robertson, Professor Dugald Stewart, Mr. Henry Mackenzie, and other persons of note, a new edition of his poems was published, from the profits of which he received nearly 500*l.* In the summer of 1788 he returned to Ayrshire, where his brother Gilbert, who had taken upon him the support of their aged mother, was struggling with many difficulties in the farm they had conjointly taken. Robert advanced 200*l.*, and with the remainder of his money he prepared to stock another farm—that of Ellisland, in Dumfriesshire—for himself. Here he took up his abode in June, 1788, having previously legalized his union with Miss Armour by joining with her in a public declaration of their marriage.

Soon after this, by the interest of Mr. Graham of Fintry, he was appointed, on his own application, an officer of excise for the district in which he lived. The salary which he received in this capacity was originally 50*l.* a year, but was eventually increased to 70*l.* His duties, however, interfered so much with the attention due to his farm that he found himself obliged to resign it to his landlord, after having occupied it for about three years and a half. About the end of the year 1791, he retired with his family to a small house in the town of Dumfries, placing his dependence for the future exclusively on his chances of promotion in the excise.

In Dumfries Burns spent the short remainder of his life. The habits which he had acquired during the sudden and short-lived intoxication of his first introduction to public notice, now gained entire ascendency over him, as misfortune and disappointment broke, or, at least, embittered, his spirit and enfeebled his powers of resistance. The strong excitements of admiration and applause, by which he had been surrounded at Edinburgh, were sought for at any cost, and among companions of any order who would join him in drowning reflection. Even the prospects upon which he had placed his reliance of advancement in the excise were suddenly overcast, in consequence of some imprudent expressions which he had dropped on the subject of the French Revolution, to which some despicable informer had called the notice of the Board. It was only through the exertions of his friend Mr. Graham, on this occasion, that he was saved from being dismissed. Ill health and great dejection of spirits at last came upon him, along with the pressure of accumulating pecuniary difficulties. He had produced many of his happiest pieces, and especially the best and the greatest number of his songs, since the appearance of the first Edinburgh edition of his poems. The songs were principally contributed to an Edinburgh publication called Johnson's 'Museum,' and afterwards to a work of much greater pretension, the well-known 'Collection of Original Scottish Airs,' edited and published by Mr. George Thomson. Burns's correspondence with Thomson on the subject of his contributions to this work has been printed, and forms a highly interesting series of letters, as well as a most affecting chapter in the poet's history. Burns's first letter, in answer to an application from Thomson, is dated from Dumfries, 16th Sept., 1792. In this he says, after entering with great zeal into the proposal, 'As to any remuneration, you may think my songs either above or below price, for they shall absolutely be the one or the other. In the honest enthusiasm with which I embark in your undertaking, to talk of money, wages, fee, hire, &c., would be downright prostitution of soul.' In July following we find Thomson sending him *5l.* with the apology, 'As I shall be benefited by the publication, you must suffer me to inclose a small mark of my gratitude, and to repeat it afterwards when I find it convenient. Do not return it, for, by Heaven, if you do, our correspondence is at an end.' Burns, in his reply to this communication says, 'I assure you that you truly hurt me with your pecuniary parcel. It degrades me in my own eyes.' However, to return it, he adds, would savour of affectation; but he protests in the strongest terms against 'any more traffic of that debtor and creditor kind.' The last letter from Burns in the collection is dated 12th July, 1796. For a year previous, illness had nearly incapacitated him from continuing his contributions. He now writes: 'After all my boasted independence, cursed necessity compels me to implore you for *5l.* A cruel * * * * of a haberdasher, to whom I owe an account, taking it into his head that I am dying, has commenced a process, and will infallibly put me into jail. Do, for God's sake, send me that sum, and that by return of post. Forgive me this earnestness, but the horrors of a jail have made me half distracted. I do not ask all this gratuitously, for upon returning health I hereby promise and engage to furnish you with *5l.* worth of the neatest song genius you have seen.'

He died on the 21st of July. His remains were consigned to the earth with the solemnities of a public funeral, which was rendered remarkably imposing by the voluntary attendance of a vast multitude of persons of all ranks from every part of the surrounding country. Burns left four sons (besides a boy who died in his infancy), all of whom, we believe, still survive.

The first collected edition of the poems and letters of Burns was published by Dr. Currie at Liverpool, in 4 vols. 8vo., in 1800, for the benefit of the poet's wife and family. Of the accounts of his life that have appeared since that by Dr. Currie, the most important are that by Mr. Lockhart, published in 1828, and that by Mr. Allan Cunningham, prefixed to his edition of the works of Burns, in eight vols. 12mo. London, 1834. This is now the most complete and in every respect the best edition of the poet's works. It contains 150 poetical pieces more than in Dr. Currie's edition: and both the poems and the letters are throughout illustrated by explanatory notes. The life occupies the first volume, the poems the next five, and the letters and glossary the two last.

The history of literature scarcely affords another instance of a popularity either so sudden or so complete as that obtained by the poetry of Burns. Even in his own lifetime, and indeed almost immediately after his genius first burst into public notice, his name and his poems were familiar to all ranks of his countrymen. Nor did the enthusiasm for his poetry die away with the generation among whom it was first kindled. His works are still everywhere a cottage-book in his own land, and they are read wherever the English language is understood.

No poetry was ever better fitted to obtain extensive popularity than that of Burns. It has little of either grandeur or richness of imagination, qualities that demand much cultivation of mind as well as a somewhat rare endowment of the poetic temperament for their appreciation and enjoyment. It is all heart and passion, and every human bosom capable of feeling strongly must be stirred by its fire and tenderness. The themes which Burns has chosen are all of the kind which come home to the natural feelings of men, and his mode of treating them is the most simple and direct. In what he has written, in his native dialect at least, there is no where anything of mere rhetorical ornament or display. The expression is throughout, as truly as that of any poetry ever was, the spontaneous utterance of the thought or sentiment, which falls into measured words as if it and they were struck out together by the same creative act. In his lyrical pieces especially, the passion, and the language, and the melody which is 'married' to the 'immortal verse,' seem to come all in one gush from the full fountain of the heart. In this exquisite truth of style no writer in any language has surpassed Burns. But, with all his nature, he is, like every great writer, also a great artist, nature being the inspiration of his art. Nothing can be more masterly—more demonstrative both of high skill and of general elevation of mind—than the manner in which he triumphs over the disadvantages of a dialect so much vulgarized as that of Scotland had come to be at the time when he wrote. Familiar as his subjects generally are, and bold and expressive as his diction constantly is, we will venture to say that there is not one instance of real vulgarity in all that he has written. Of mere license and indecorum there is certainly no want in some of his productions; but even in his broadest humour, in his most unpardonable violations of moral propriety, in the rudest riot of his merriment and satire, there is never anything that is mean or grovelling, anything that offends our sense of what is noble and elevated. Some of the most immoral of his pieces are distinguished by a studied propriety of expression springing from the finest taste and most delicate sensibility to the beautiful.

BURNT-EAR. *Burnt-ear*, in corn, is a disease in which the fructification of the plant is destroyed and, as it were, *burnt* up; hence its English name and the corresponding term of *charbon* in French and *brand* in German. Burnt-ear has often been confounded with *smut*, which is a similar but distinct disease. They differ in this, that in the *burnt-ear* the black powder which appears in the ear is external, and the grain has either never been formed, or its coat has been destroyed, so that the whole ear appears black or burnt. The powder also has no smell, and being easily blown away by the wind, or shaken off in the reaping, little of it adheres to the corn or is mixed with it when ground; and except the loss of so much grain as would have been contained in the sound ears, no great detriment arises to the quality of the corn. The smut, or pepper-brand, on the contrary, is contained in the body of the grain, which retains nearly its natural form, and is carried along with it into the barn. It is only in the threshing or grinding that the diseased grain commonly called smut-ball is broken, when a fetid black powder is dispersed over the sound grain, which greatly deteriorates the flour, and renders the corn unfit for seed, the disease being perpetuated by this black substance. [SMUT.] Burnt-ears are generally observed in particular moist situations, and some lands are much more subject to them than others. The disease has been often attributed to damp and warm fogs succeeding very dry weather; and hence it has been imagined that it was caused by the dews lodging in the ears and producing a species of rottenness. But microscopic observations have decidedly proved that the black powder consists of the minute germs or seeds of a parasitical mushroom, which are developed in the growing ears and live on its substance.

The plants attacked by this disease may be distinguished long before the ear makes its appearance out of the sheath in which it is enveloped in its early state. There is a peculiar greenness of the leaf observable; and when the plant is examined, the young ear may already be seen attacked by the disease and beginning to put on a spotted and black appearance, which increases as it grows, and is perfected when the ear arrives at the state in which the flower should appear. In some cases the plant flowers partially or completely, and the fecundation takes place, so that the germ is developed; but it never approaches to maturity. Its outer skin is soon destroyed by the parasitical fungus, and the whole substance converted into a black powder.

De Candolle, one of the best modern authorities on the physiology of plants, has named this peculiar minute mushroom the *Uredo carbo*, which he distinguishes from that which produces the smut, and which he calls *Uredo caries*. They are easily distinguished by the size and smell. The *Uredo carbo* is composed of much smaller globules and destitute of smell; both seem to be propagated like other cryptogamous plants by means of extremely minute seeds or germs, which are carried along with the sap into the circulation and vegetate in the ear, where alone it appears that they find the conditions necessary to their growth.

Mr. Benedict Prevost has asserted that having placed the black dust of burnt-ears of wheat in distilled water at the temperature of 10° of the centigrade thermometer (about 50° of Fahrenheit's), he observed that they swelled to twice their original size, and pushed out oblong tubercles, which lengthened to five or six times their diameter, and that they afterwards divided into several branches. After a few days minute grains were observed in the vessels, and the original globules showed an appearance of cells, from which the grains had been ejected. The natural conclusion from this observation, if it be correct, is, that the globules are real bulbs or germs of microscopic mushrooms, which are developed by moisture in favourable situations; and to these the name of *Uredo* has been given, one species being the *Uredo carbo*, which attacks the external parts of the grain, and the other *Uredo caries*, which grows within the grain itself. (See Mr. Benedict Prevost's memoir to the Institute of France in 1807.)

It is doubted by some whether the disease is contagious, because they have never been able to produce it by shaking the black dust of burnt-ears over the sound plants. The reason of this is probably that the exhaling vessels of the surface are not so well calculated to absorb extraneous matter, which can only enter by the spongioles of the roots. Although it is much less dangerous than the smut, because it is readily dispersed by the winds, yet it must more or less infect the soil, and hence the disease is more frequent where it has appeared before, and where those grains which are most subject to the disease, such as wheat, barley, and oats, have been sown in too rapid succession. As it does not adhere to the grain, steeping and washing are not so certain remedies against the infection as in the case of smut; but the best preservative is to drain the land well and keep it in good heart, so that the plants may be vigorous and able to resist the attacks of the parasite: for it is a well-known fact, that weak plants, as well as animals, are much more exposed to the attacks of parasitical plants or animals than those which are vigorous and robust. A judicious change of crops, or a well-established rotation, will in general secure the corn; which is sown in its proper course, from the infection of the *Uredo carbo*, provided the preparation of the land be such as to ensure a healthy vegetation*.

As this disease is extremely common, it has obtained various names in different parts of the country. In England it is best known by the names of blacks, brand, or burnt-ear; and it is often called *smut*, from the supposition that it is a variety of the same disease which attacks the external part of the fructification before the skin of the grain is formed. Whether there may not be some truth in this latter supposition, notwithstanding the opinion before quoted, we do not at present presume to determine.

BURRAMPOOTER. [BRAHMAPOOTRA.]

BURROWING OWL. [OWL.]

BURSA, or BRUSA, the antient Prusa and capital of Bithynia, is beautifully situated at the foot of Mount Olympus in Asia Minor, in 27° N. lat., 40° E. long. The luxuriant plain which lies in front of the city is covered for many miles with plantations of mulberry trees, which nourish the silkworms that supply the staple trade of the place. The grand mountain in the rear of the town furnishes the finest pasturage, an abundance of timber, and underwood for fuel; and a number of cool perennial springs gush out from the roots of Olympus, supplying the town with a superfluity of the purest water, and fertilizing all the surrounding country. As every house in Brusa has its fountain, the total number is immense, and some of the public fountains and conduits are beautifully constructed. The old traveller Tournefort says he never saw a city with so many fountains, except perhaps Granada in Spain. The streets are remarkably clean and well paved, particularly the bazaar quarter. According to M. Fontanier, a recent French traveller, Brusa contains 125 mosques, a great number of khans, and a population of about 100,000 souls. The citadel, which commands the town, stands on a rocky eminence, the Acropolis of antient Prusa. Parts of the walls are of Greek construction, and many antient fragments are imbedded and mixed up in the Turkish building. Within the fortress there is an old Greek church converted into a Mussulman mausoleum, where repose the bones of Sultan Orcan, his wives, and children. Orcan lived in the fourteenth century, and in 1327 took Brusa (which he made the residence and capital of the Ottoman dynasty) from the unwarlike Greek emperor. The monuments erected over these graves are covered with magnificent Cachmire shawls.

But the most remarkable edifices in Brusa are the thermal baths, which are extensive and magnificent. The finest of them (Eski-kaplidja) is an antient Greek building. The mineral waters that supply them gush out from the base of Mount Olympus; they have a strong sulphureous odour, and in temperature range from 60° to 70° of Reaumur, that is from 167° to 190° of Fahrenheit. In the environs of Brusa, melons of exquisite quality and fruits of all kinds are cultivated: the Greeks and Armenians there established make good wine, but the capital produce is silk, which is worked up to a very considerable extent on the spot, and largely exported. The demand in England for Brusa silks is at this moment (April, 1836) much on the increase. The pieces manufactured at Brusa are exceedingly strong, tasteful in design, and very enduring. In many of the articles British cotton yarn is woven with the native silk, and a strong and beautiful stuff is produced from the mixture—the dyed silk, on which flowers or other patterns are wrought, being singularly tenacious of its colour. Brusa is a good market for the cotton yarn, or twist, of Manchester and Glasgow. This article of manufacture is landed at Constantinople, and thence forwarded by caravan to Brusa. On the whole, this is the pleasantest city which the Turks possess in Asia Minor, and in industrial and commercial importance it only yields to Smyrna and its neighbourhood.

BURSA'RIA (Zoology), the name of a genus of minute *Microzoaria apoda*, with a membranous body, short, and a little bent upon itself, so as to be concave below and convex above.

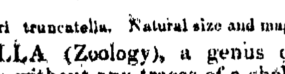
De Blainville observes that this form is very probably composed of species of floating *Planariæ*, slightly bent upon themselves, but that he is not certain of this, as he never examined the subjects accurately. He adds that it is still more difficult to say what *Bursaria hirundinella*, of which M. Bory has formed his genus *Hirundinella*, is.

Lamarck places *Bursaria* among his Infusoria, observing that their body is delicate and membranous, and remarkable by its concave form on one side, which sometimes puts on the appearance of a boat, sometimes of a purse. Their movements are not lively, and it is said that they are irregular, so that when they describe a spiral line from right to left and raise themselves in the water they move with tolerable swiftness; but when they return or descend they only proceed slowly, a difference of velocity attributable to their form.

Locality. Fresh and stagnant waters, and sea water. Lamarck describes five species, the first of which, *Bursaria truncatella*, is visible to the naked eye, and is found in ditch-water.

According to Ehrenberg, the *Bursariæ*, as well as the *Loxodes*, the *Trachelicæ*, &c. have an intestinal tube furnished with cæcal appendages which open anteriorly at the inferior surface of the body, and posteriorly at its extremity. The mouth is without cilia or hooks, and there is no ciliary circle on the front. The *Bursariæ* differ besides from the other two genera by the form of the upper lip, which is compressed, subcarinated, or swollen, and not contracted. The body of the *Bursariæ* is, for the most part, downy.

Example, *Bursaria truncatella*. Müller.



[Bursari truncatella. Natural size and magnified.]

BURSATELLA (Zoology), a genus of marine molluscous animals without any traces of a shell; placed by De Blainville under his second family *Aplysiacea* (Aplysians) of his third order, *Monopleurobranchiata*, of his *Para-*

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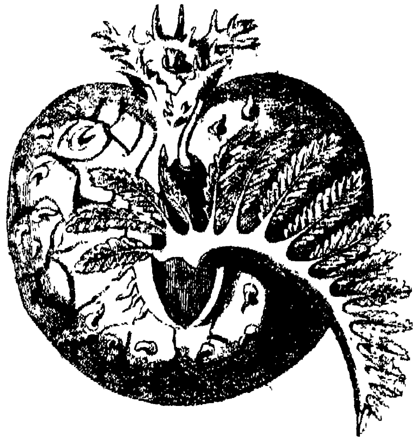
* Steeping the seed in brine or stale urine, and drying it with fresh burnt lime, as is usually done with wheat, is however a useful precaution, which should be adopted also with barley and oats, wherever burnt ears have appeared in preceding crops. Sulphate of copper is said to be more efficacious than common salt.

cephalophora monoica. The following is De Blainville's definition of the genus, which, in his arrangement, comes between *Dolabella* and *Notarchus.* Rang thinks it ought to belong to the genus *Aplysia.*

Body subglobular; below, an oval space circumscribed by thick lips indicating the foot, above, a symmetrical oval opening with thick lips, formed by the complete junction of the natatory appendages of the mantle, and communicating with a cavity in which are found one very large free gill and the vent. The tentacula are four, divided and ramified, besides two buccal appendages.

Example, *Bursatella Leachii,* which De Blainville says is the only species of the genus. It is large and a native of the East Indian seas.



[Bursatella Leachii.]

BURSERA'CEÆ, a natural order of exogens consisting of balsamic, resinous, or gummy plants with pinnated leaves, and small hermaphrodite or unisexual polypetalous flowers, with a superior ovary seated in a large circular disk. The fruit is a 2-5-celled drupe, with its rind sometimes splitting into valves. It was formerly included, among other orders, in the Terebintaceæ of Jussieu, but it differs from Amyridaceæ and Anacardiaceæ in its compound fruit. Myrrh, frankincense, olibanum, balsam of Acouchi, gum elemi, balm of Gilead, and opobalsamum, or balsam of Mecca, are all products of different species of the order. [BALSAMODENDRON.]

BURSLEM, a parish and market-town in the northern division of the hundred of Pirehill, Staffordshire, 2½ miles from Newcastle-under-Lyne, and about 137 miles direct distance N.W. from London. Burslem is a chief town in the important district called 'The Potteries,' the principal seat of the earthenware manufacture of England. The parish, which is in the diocese of Lichfield and Coventry, has an area of 2930 acres, with a population, in 1831, of 12,714, of which 11,250 belonged to the town. The gross annual income of the living, which is a rectory, is stated at 530*l.* The township of Halton Abbey and the hamlet of Sneyd are included in the parish.

Burslem has a market twice a week, on Mondays and Saturdays; the market-house is a neat edifice of modern erection, surmounted by a clock. The district of 'The Potteries' is steadily advancing in improvement, and contained, in 1831, a population of 53,000; but from the nature of the employment, the cheapness of building materials, and other circumstances, the number of houses of the annual value of 10*l.* and upwards was only from 1400 to 1500. 'The Potteries' were enfranchised under the Reform Act, and constitute the borough of Stoke-upon-Trent. [STOKE-UPON TRENT.]

There were, in 1835, thirty-seven daily schools and eleven Sunday schools in the parish of Burslem.

(*Beauties of England and Wales; Boundary Reports; Pop., Eccl., and Educ. Returns.*)

BURTON, ROBERT, author of the 'Anatomy of Melancholy,' was born at Lindley, in the county of Leicester, Feb. 8th, 1576, and was descended of a reputable and antient family. He received part of his education at the grammar-school of Sutton-Coldfield, in the county of Warwick; and was admitted a commoner of Brazenose-college, Oxford, in 1593, where he made considerable progress in logic and philosophy. In 1599 he was elected student of Christchurch. In 1616 he was presented to the vicarage of St. Thomas, in the gift of that college; and at a later period, after the year 1628, he was presented, by Lord Berkeley, to the rectory of Segrave in Leicestershire. It is said that he composed the Anatomy of Melancholy, published in 1621, with the intent of diverting his own thoughts from that feeling. These are all the facts and dates recorded by Anthony Wood concerning Burton's life. He died at Christchurch, Jan. 25th, 1639-40, at or very near the time which he had before foretold from the calculation of his own nativity. This coincidence gave rise to a rumour, which probably was jocose rather than serious, at least there is not a particle of evidence to support it, that he hastened his own death that his astrological skill might not be put to shame. He bequeathed two sums of 100*l.* each to the Bodleian and the Christchurch library, the annual proceeds to be employed in purchasing books; and he also ordered that those two establishments should select from his own collection any books which they did not possess. Those acquired by the Bodleian are said by Bliss, in his edition of Wood's Athenæ Oxon., to form one of the most curious additions ever made to that collection. 'They consist of all the historical, political, and poetical tracts of his own time; with a large collection of miscellaneous accounts of murders, monsters, and accidents. In short, he seems to have purchased indiscriminately everything that was published.'

Wood gives the following character of Burton:—'He was an exact mathematician, a curious calculator of nativities, a general-read scholar, a thorough-paced philologist, and one that understood the surveying of lands well. As he was by many accounted a severe student, a devourer of authors, a melancholy and humorous person; so by others who knew him well, a person of great honesty, plain dealing, and charity. I have heard some of the antients of Christchurch often say that his company was very merry, facete, and juvenile; and no man in his time did surpass him for his ready and dexterous interlarding his common discourses among them with verses from the poets, or sentences from classical authors; which being then all the fashion in the university, made his company more acceptable.'

Some notion of Burton's habits, and of the peculiarity of his digressive and pleonastic style may be formed from the following sentences, selected at intervals from the Preface to the 'Anatomy of Melancholy:'—'I had a great desire (not able to attain to a superficial skill in any) to have some smattering in all; to be *aliquis in omnibus, nullus in singulis,* which Plato commends. . . . This roving humour, though not with like success, I have ever had; and like a ranging spaniel that barks at every bird he sees, leaving his game, I have followed all, saving that which I should; and may justly complain and truly, *Qui ubique est, nusquam est* (which Gesner did in modesty), that I have read many good books, but to little purpose, for want of a good method. . . . I am not poor, I am not rich; *nihil est, nihil deest;* I have little, I want nothing; all my treasure is in Minerva's tower. I still live a collegiate student, as Democritus in his garden, and lead a monastic life, *ipse mihi theatrum,* sequestered from the tumults and troubles of the world.' Then after a long catalogue of the troubles and accidents which befall those who 'run, ride, turmoil, and macerate themselves in town and country,' he continues, 'This I daily hear, and such like both public and private news, amidst the gallantry and misery of the world—jollity, pride, perplexities and cares, simplicity and villainy, subtlety, knavery, candour, and integrity, mutually mixed and offering themselves; I rub on *privus privatus;* as I have still lived so I now continue, *statu quo prius,* left to a solitary life and mine own domestic discontents; saving that sometimes, *ne quid mentiar,* as Diogenes went into the city, and Democritus to the haven, to see fashions, I did, for my recreation, now and then walk abroad, look into the world, and could not chuse but make some little observation; *non tam sagax observator ac simplex recitator,* not as they did, to laugh at all, but with a mixed passion.' Bishop Kennet says, in his 'Register and Chronicle,' p. 320, 'In an interval of vapours he would be extremely pleasant, and raise laughter in any company; yet I have heard that nothing else would make him laugh but going down to the bridge foot in Oxford, and hearing the bargemen scold, storm, and swear at one another, at which he would set his hands to his sides and laugh most profusely; yet in his college and chamber so mute and mopish that he was suspected to be *felo de se.*'

We give the title, which contains an analysis, of his work at length. 'The Anatomy of Melancholy: what it is; with all the kinds, causes, symptomes, prognosticks, and severall cures of it. In three maine partitions, with their severall sections, members, and subsections. Philosophically, medicinally, historically opened and cut up. By Democritus Junior. With a satyricall Preface, conducing to the following Discourse. Macrob. *Omne meum; nihil meum.*' In defence of this title he says, 'It is a kind of policy in these days to prefix a fantastical title to a book which is to be sold; for as larks come down to a day-net, many vain readers will tarry and stand gazing.' The name of Democritus Junior is introduced in the inscription on his monument in Christchurch cathedral: on which the calculation of his nativity was also engraved. A plate of it is given in Nichols's 'History of Leicester,' vol. iii. p. 418, from which, together with the Athenæ Oxonienses, this article is compiled. The 'Anatomy,' &c. at first was very popular, and went through five editions before the author's death. Towards the close of the 17th century it fell into oblivion, and was seldom seen except on the book-stalls, until brought into notice by Johnson (who said that it was the only book that ever took him out of bed two hours sooner than he wished to rise), Warton, and others. Mr. Steevens in his own copy noted a rise in price, within a few years, from eighteen pence to a guinea and a half. Since that time one edition at least has been published. Sterne was largely indebted to Burton's peculiar humour, though he never acknowledged it: many even of his stories are copied word for word from the 'Anatomy of Melancholy,' this Dr. Ferriar has fully shown in his 'Illustrations of Sterne,' 1798. The 'Anatomy of Melancholy' displays that extent and variety of reading to which Sterne was a pretender: it is termed a *cento* by its author, and consists chiefly of an immense mass of quotations, bearing on a great variety of subjects, some very little connected with the main topic of the work. Warton speaks of it in the following terms. 'The writer's variety of learning, his quotations from scarce and curious books, his pedantry sparkling with rude wit and shapeless elegance, miscellaneous matter, intermixture of agreeable tales and illustrations, and perhaps, above all, the singularities of his feelings clothed in an uncommon quaintness of style, have contributed to render it, even to modern readers, a valuable repository of amusement and information.' (Milton's *Minor Poems*, p. 93.)

Not to be confounded with the above is the author of a number of cheap books published about the beginning of the 18th century, with the name of Robert Burton in the title-page. (See Chalmers's *Biog. Dict.*)

BURTON-IN-KENDAL. [WESTMORELAND.]

BURTON-UPON-TRENT, a market-town in the hundred of North Offlow, on the Trent, in Staffordshire, 22 miles E. from Stafford, and 109 N.W. from London. The parish of Burton-upon-Trent is partly in Staffordshire and partly in Derbyshire; it is in the diocese of Lichfield and Coventry; the average gross annual income of the living is stated at 192*l.* The area of the parish is 9030 acres, with, in 1831, 6988 inhabitants. The town, though usually called a borough, is not incorporated. On the dissolution of the monasteries, Henry VIII. granted to an ancestor of the marquis of Anglesey, the present lord of the manor, the manor of Burton-upon-Trent, including the town and several hamlets, which formed part of the possessions of the Abbey of Burton, together with various privileges which had been enjoyed by the abbots. By virtue of this grant, the lord of the manor appoints a steward and bailiff, who hold their offices during his pleasure. The bailiff has the management of the police and the general regulation of the town, except as to paving and lighting, which is vested in commissioners under a local act.

The abbey of Burton was founded in the beginning of the eleventh century by an earl of Mercia, and it received charters and immunities from several kings. Some of the abbots sat in parliament. There are scarcely any remains of the once extensive buildings of this abbey. The most remarkable object connected with the town is the bridge, which is of considerable antiquity, and is the longest bridge in England. It has thirty-six arches, and is 1545 feet in length. The bridge connects at this place the counties of Stafford and Derby, and towards the middle of it is the legal boundary.

Leland states that in his time Burton was noted for its alabaster works. How long these works continued to flourish is unknown. Alabaster is found in the neighbourhood of Needwood Forest. Burton has long been, and still is, celebrated for its ale, which constitutes the chief manufacture of the place. The town consists of two principal streets, one running parallel to the river, and another cutting it at right angles. The market-day is Thursday; there are four annual fairs, one of which lasts five days. The Education Returns of 1835 state that there are nineteen daily schools, and six Sunday schools in the parish. The free grammar-school was founded and endowed in 1520 by the then abbot of Burton. Considerable estates for charitable and other purposes for the benefit of the town are vested in trustees. The grand Trunk Canal, which is called also the Trent and Mersey Canal, passes Burton, and communicates with the Trent about a mile below the town. The Trent, which falls into the Humber, is navigable for barges up to Burton-upon-Trent. (Gough's *Camden*; Shaw's *Staffordshire*; *Beauties of England and Wales*; *Municipal Corporations Report*; *Pop., Eccl., and Educ. Returns.*)

BURTSCHEID, BORSCHEID, or **BORCETTE.** [AIX-LA-CHAPELLE.]

BURY, a m. t. in the co. palatine of Lancaster, made a bor. in 1832 under the Reform Act, with the privilege of sending one member to parliament. It is 195 m. N.N.W. of London, 9 N.N.W. of Manchester, 6 E.N.E. of Bolton, 7 W.S.W. of Rochdale, 16 S.E. of Blackburn, 9 S. of Haslingden, and 48 S.E. by S. of Lancaster.

The par. comprises the town of Bury, the t. of Elton and Walmersley, including Shuttleworth, and the chapelries of Higher Tottington and Lower Tottington, and Heap, including Heywood, all in the hund. of Salford; and the t. of Coupe-Lench-cum-Newhall Ley-cum-Hall Carr, Henheads, and Musbury in the hund. of Blackburn. The pop. of the par. has more than doubled since 1801, as the following table will show:—

	1801.	1811.	1821	1831.
Bury t.	7,072	8,762	10,583	15,086
Coupe Lench, New Hall Hey-cum-Hall Carr t. . .	676	786	1,294	1,519
Elton t. . . .	2,080	2,540	2,897	4,054
Heap-cum-Heywood chap. . .	4,283	5,148	6,552	10,429
Musbury t. . . .	463	589	728	1,231
Tottington (Higher) chap. .	1,246	1,556	1,728	2,672
Tottington (Lower) chap.	4,314	5,917	7,333	9,280
Walmersley and Shuttleworth t.	2,166	2,619	3,290	3,456
Total . . .	22,300	27,917	34,335	47,627

The annual value of the par. presents a still greater proportionate augmentation during the period of which we have returns, viz.:—

	1815.	1829.
Bury . . .	16,546	34,954
Coupe-Lench, &c. . .	8,627	2,494
Elton . . .	6,370	11,178
Heap, &c. . . .	8,861	27,820
Musbury . . .	1,299	2,379
Tottington (Higher) . .	4,366	6,583
Tottington (Lower) .	9,011	16,815
Walmersley . . .	5,822	7,770
Total .	£60,902	£109,993

The town of Bury has been very much enlarged and improved within the last few years. The streets are now lighted with gas; and more attention is paid than formerly to the paving and cleansing of the streets. There are no waterworks, but the inhabitants are well supplied with water by means of pumps. Though the town stands on rising ground, it seems relatively low, from the hills which surround it on the N. and E. The river Irwell, which does not take this name till it reaches Bury, flows through the W. end of the town, and is joined by the Roche about two miles to the S. In antient times one of the twelve baronial castles of the county stood close to this town, not far from the parish church, on the banks of what was then the course of the Irwell; but the river now takes a more N.W. course, and leaves a fertile tract of land in the valley between its present and its antient bed. The time and the cause of this change are not known. It has been conjectured to be owing to the works of the besiegers in 1644, when the town was attacked by the parliamentary troops, and the ruins of the castle were entirely demolished. Nothing now remains to mark the former existence of this fortress but fragments of stone, which are occasionally dug out of its antient foundations. In Leland's time part of the ruins remained, as he alludes to them in his description of the place. 'Byri on Irwel water, four or five miles from Manchester, but a poore market. There is a ruine of a castel by the paroch church yn the towne. It longgid with the towne sumtime to the Pilkentons, now to the Eries of Darby.' The place where it stood is still called Castle Croft, from which may be seen Castle Steads, the name of the spot, in the adjoining township of Walmersley, where the besiegers threw up an intrenchment which enabled them to effect their purpose of battering down the walls of the castle. The name of the town has its origin, according to some antiquaries, from this feudal building, Byri signifying, in Saxon, a castle or fortified place. According to other authorities, Bury was a Roman station, in the vicinity of Coccium, if not that celebrated place itself: but this opinion is now generally allowed to be unsupported both by geographical and antiquarian evidence, no remains of Roman antiquity having been discovered in the town or immediate neighbourhood.

The history of the manor of Bury is unknown prior to the reign of Henry II. It was then, along with some adjoining manors, according to the Townley MSS., in the possession of John de Lacy. The family of Henry de Bury afterwards became the owners of the lordship of Bury, and they were succeeded by the Pilkingtons, a family of note, whose residence, in Leland's time, was about three miles distant from Bury, at Pilkington Park. It remained in the possession of the Pilkington family until, by the attainder of Sir Thomas Pilkington, in the reign of Henry VII., his estates being confiscated and given to the Stanleys, the manor went along with them. Since that time the manorial rights have belonged to the Earl of Derby.

The population of Bury was no doubt originally composed of such persons as were required near a baronial residence of such importance as the castle above described. In process of time, as the feudal baronies decayed, new settlers introduced new occupations, and in this manner the manufacture of woollen cloth became a staple article of trade in this place, so far back as the fourteenth century, and flourished to such an extent that in the reign of Elizabeth one of her aulnagers was stationed in the town to stamp the cloth. Up to a much later date than this, woollens were almost the sole manufacture of the place; but upon the introduction of the cotton trade into the county many of the inhabitants became weavers of cotton fabrics, and the woollen trade has been gradually retiring into Yorkshire and other parts of the country where the cotton manufacture is less paramount. The number however still employed in this town in manufacturing flannel, baize, blankets, coating, &c. is estimated at 4000.

But a still larger proportion of the population are engaged in the different branches of the cotton trade, which, owing to the vicinity of Bury to the Manchester market, and the abundant supply of coal and water, are carried on to a considerable and increasing extent in this and the adjoining township. The mills for the spinning of cotton are large and numerous, and employ a great number of the inhabitants.

Several important improvements in the cotton manufacture took their rise in this place. A new method of throwing the shuttle by means of the *picking-peg* instead of the hand, and thence called the fly shuttle, was invented by John Kay, a native of the town: and in 1760 his son, Robert Kay, invented the drop-box, by means of which the weaver can at will use any one of three shuttles,—an invention which led to the introduction of various colours into the same fabric, and made it almost as easy to produce a fabric consisting of different colours as a common cloth of only one. Bury is indebted for one branch of its present trade to the late Sir Robert Peel, who established his extensive print works on the banks of the Irwell, near this town. He resided at Chamber Hall, in the immediate vicinity, where the present Sir Robert was born. Besides these different branches of the cotton and woollen manufacture, there are extensive bleaching-grounds and iron-foundries. The manufacture of hats and hat-bodies is also carried on to a considerable extent.

A branch of the Manchester, Bolton, and Bury canal, constructed under an act of parliament in 1791, furnishes a ready communication by means of a packet-boat with those places, as well as by the common boats for tonnage to all parts of the kingdom. There is no lock on this canal between Bury and Bolton; but the fall into the river Irwell at Manchester is 95 ft.

The public officers of the town consist of three constables, who are appointed at a court-leet held at Whitsuntide, which is summoned by the agent of the Earl of Derby: a deputy constable, who holds his office for life, acts under these officers. Two other court-leets are held in April and October, under the same nobleman, for the nomination of a court baron which is held every third week for the recovery of debts under 40*s*. The jurisdiction of all these officers extends over the whole parish. Petty sessions for the division are held weekly. There is a weekly market on Saturday, which is well supplied; but that which was formerly held, according to the charter, on Thursday, has been long discontinued. The three annual fairs are held on March 5th, May 3rd, and September 18th.

The living of Bury is a rectory in the deanery of Manchester, and in the archdeaconry and diocese of Chester, returned in 1835 as of the net annual value of 1937*l*., of which the Earl of Derby is patron. The value of the living was very considerably augmented by an act of parliament passed in 1764, empowering the rector for the time being to grant building-leases of the glebe land for ninety-nine years, renewable at any period in the interim. The glebe land occupies nearly one-half of the town. The church to which this living belongs is dedicated to St. Mary. It was formerly a Gothic structure; but in 1776 it was rebuilt, all but the steeple, and in a different style of architecture, as it is probable that the steeple, which has a short spire upon it, was of more recent date than the antient edifice. St. John's chapel, in Stanley Street, erected in 1770, is a neat building in the patronage of the rector, who has also the presentation to all the episcopal chapels in the parish. The living of St. John's is a perpetual curacy, endowed with 600*l*. of private benefaction, 400*l*. royal bounty, and 1500*l*. parliamentary grant.

The Dissenting places of worship in the town are numerous. The oldest is the Presbyterian chapel in Silver Street, belonging to the Unitarians, which, during a period of 105 years after it was erected, had only three ministers. The Independents have two chapels, one in the New Road, erected in 1792, and the other called Bethel Chapel, in Henry Street, erected in 1807. The Methodists of the new connexion, the Wesleyans, and the Primitive Methodists have separate meeting-houses. The Roman Catholics have also a chapel.*

To all the churches and chapels are attached Sunday-schools, which afford instruction to 4224 children. In connexion with the Established Church 1013 are educated; Independents, 900; Methodists, 1304; Unitarians, 330; Roman Catholics, 155; and in factory schools, 522. (*Report of Statistical Society in Bury.*)

The public charities and institutions in Bury consist of a free grammar-school, a good building near the church. This school was founded in 1726, by the Rev. Roger Kay, and endowed with estates which now yield a revenue of 436*l*. 15*s*. 3*d*. It is divided under two masters into two schools, the upper and lower. In the upper school, besides a number of boarders which the head master is allowed to take, about twenty boys are educated on the foundation; and fifty boys in the lower school. The course of instruction in the upper school is classical and mathematical, no boy being admitted who is not competent to commence reading an easy Latin author. Before admission into the lower school, the boys are required to read well, and they are taught, in addition to reading, writing, and accounts, English grammar, geography, and English history; and if a boy intends to advance to the upper school, he is taught the Latin grammar; but very few boys go to the upper from the lower school. The terms in the upper school are 5*s*. on entrance, and 5*s*. at Shrovetide, Midsummer, and Christmas. Half this sum is paid by the boys in the lower school. There are two annual exhibitions on this foundation for seven years to either of the two universities. The management of the school is vested in thirteen trustees, seven of whom must be beneficed clergymen residing within ten miles of the town, and six laymen.

A charity school for the instruction of eighty boys and thirty girls was founded in 1748, by the Hon. and Rev. John Stanley, formerly rector. In 1815, the funds of the charity having been much augmented by annual subscriptions, it was converted into a national school; and a spacious building was erected, two stories in height, the upper room being used for girls, and the lower room for boys. It now provides for the education of 280 children, of which number about sixty of the boys and forty of the girls are clothed in pursuance of the will of the founder. There are two infant schools, containing 240 children, chiefly supported by the weekly contributions of twopence each.

A dispensary and lying-in charity are supported by annual subscriptions. There are several small charities for the distribution of linen cloth among the poor of the town of Bury, viz. Guest's charity, 10*s.* a-year; Banks's charity, 3*l.* a-year; Rothwell's charity, 10*s.* a-year; and Waring's charity, 1*l.* 1*s.* a-year. Besides these, Shepherd's charity furnishes 9*l.* for annual distribution among the poor; and Yates's charity 16*l.* 3*s.* for the relief of aged persons.

There are also other charities belonging to the parish, which altogether form only a small amount.

A savings' bank was established in Bury in 1822. There is a public subscription library, a news room, a mechanics' library, a medical library, and a billiard room.

BURY ST. EDMUND'S, a borough and market-town, having separate jurisdiction, locally situated in the hundred of Thingoe, in the western division of the county of Suffolk, 25 miles N.W. by W. from Ipswich, and 72 miles N.E. by N. from London. The borough contains 3040 English statute acres, and is co-extensive with the two parishes of St. James and St. Mary.

Origin and early History.—The origin of Bury St. Edmund's, or St. Edmund's Bury, as it is called by old writers, has been a subject of much discussion. Some say it was the Villa Faustina of the Romans, mentioned in the itinerary of Antoninus, and that it owed its name to Faustinus, or to Faustina, the wife of the Emperor Antoninus Pius; others say it derived its name from *faustus* (prosperous, happy), and so signified the 'happy town.' It is at least certain, from the number of Roman antiquities dug up in the neighbourhood, that it was at one time in the possession of that people. At the time of the dissolution of the Heptarchy, it belonged to Beodric, and was hence called Beodric's-worthe or Beoderici-cortis, the villa or mansion of Beodric. Dr. Yates, in his 'History of the Town and Abbey of Bury St. Edmund's,' endeavours to derive its latter name from two Saxon words meaning a place dedicated to religious worship; but the former derivation is more natural (as it actually belonged to Beodric), and therefore more satisfactory. Beodric bequeathed it to Edmund the king and martyr, after whom it was called St Edmund's Bury—Bury, like Beri, burg, burgh, &c., being a Saxon word meaning castle or strong town.

Edmund, having succeeded to the throne of East Anglia, was crowned at Bury on Christmas-day, 856, and in the 15th year of his age. In 870 he was taken prisoner and cruelly put to death by the Danes. The following is the fabulous history given of the circumstances attending his death, to which tradition the corporation owes the devices on its arms and seal. St. Edmund, being a Christian as well as an enemy, was first scourged and then bound to a tree and his body pierced with arrows. His head was then cut off and thrown into a neighbouring wood. On the departure of the Danes, the East Anglians assembled to pay the last solemn tribute of affection to their martyred king. The body was found bound to the tree, and was interred in a wooden chapel at Hoxne; but no where could they find the head. At last, after a search of forty days, the head was discovered between the fore paws of a wolf, which immediately resigned its charge unmutilated, and quietly retired into the wood. 'An unkouth thyng,' says Lydgate, 'and strange ageyn nature.' The head, on being placed in contact with the trunk (which was not the least decomposed), is said to have united with it so closely that the separation was scarcely visible.

Monastery, Antiquities, &c.—Soon after the martyrdom of King Edmund, six priests devoted themselves to a monastic life under the patronage of the royal saint, and founded a monastery, which, in after ages, by the magnificence of its buildings, the splendour of its decorations, its valuable immunities and privileges, outshone any other ecclesiastical establishment in Great Britain, Glastonbury (in Somersetshire) alone excepted. Leland, who saw the abbey probably when in its highest state of perfection, thus describes it: 'The sun hath not shone on a town more delightfully situated, with a small river flowing on the eastern part, or a monastery more illustrious, whether we consider its wealth, its extent, or its incomparable magnificence. You might indeed say that the monastery itself is a town; so many gates there are, so many towers, and a church than which none can be more magnificent; and subservient to which are three others, also splendidly adorned with admirable workmanship, and standing in one and the same churchyard.'

Amongst the first benefactors of the monastery were King Athelstan and Edmund, son of King Edward the Elder. The latter conferred on it many valuable privileges, which he confirmed by royal charter. Previous to the destruction of Bury by Swein in the beginning of the 11th century, Ailwin, who had been appointed to the high office of 'guardian of the body of St. Edmund,' fearing lest the Dane should get possession of the holy relic, conveyed the remains to London. The bishop of that see clandestinely took possession of the precious relic, and refused to return it; but after some altercation, it was carried back by Ailwin, then bishop of Hulme, and placed in the abbey church of Bury.

In 1020 Ailwin ejected all the secular clergy from Bury, and established twelve Benedictine monks from the monastory of Hulme in the abbey, exempted them from all episcopal authority, and laid the foundation of a beautiful church, which was consecrated in 1032. The three first churches were built of wood, but in the year 1065 another was erected of hewn stone, under the auspices of Abbot Baldwyn. It took twelve years building, and was embellished by numerous ornaments brought from Caen, in Normandy. It was 505 feet in length; the transept was 212 feet, and the western front 240 in breadth; altogether it contained twelve chapels. Part of the ruins of the western front still remain. One of the towers, which seems to bid defiance to time or weather, has been converted into a stable; and the three arches, which once formed the entrance to the three aisles of the church, have been filled up with modern brick-work, and now form convenient dwelling-houses.

There appear to have been four grand gates to the abbey, and its lofty embattled walls inclosed within its vast circumference the body of the monastery, the abbot's palace, the garden, &c., chapter-house, towers, cloisters, infirmaries, the magnificent monasterial church, an extensive churchyard, three smaller churches, and several chapels. The abbey contained 80 monks, 16 chaplains, and 111 servants; besides the abbot, who was a spiritual parliamentary baron, held a synod in his own chapter-house, and appointed the parochial clergy of the place. He inflicted capital punishment, and had the power to try by his steward all causes within the liberty of Bury. Beyond the circuit of the abbey walls were several hospitals and chapels under the patronage and protection of the monks. As a proof of the despotic power possessed by the abbot and his monks, it is sufficient to mention that in the 13th century some Franciscan friars came to settle at Bury, and built a handsome monastery; but the monks of Bury pulled it down, and drove the friars out of the town with impunity. Edward the Confessor granted to the abbot the liberty of coining, and Edward I. and Edward II. both had mints here. Some pennies coined at Bury still exist in the cabinets of antiquaries. Henry I., on his return to England after his interview with pope Innocent III., came to Bury to pay his devotions to the shrine of St. Edmund. During the contests which took place between Henry II. and his son, a large army was assembled at Bury in support of the king. The rival armies met at Fornham St. Genevieve (a place in the neighbourhood), on the 27th of October, 1173; and the victory, which was obtained by the royalists, was chiefly attributed to their carrying before them the sacred standard of St. Edmund. Richard I. paid a devotional visit to the shrine of the saint on his return from the Holy Land, and presented to the monastery the rich standard of Isaac, king of Cyprus. It was here also that John was first met by the refractory barons, when he was compelled to sign Magna Charta. In 1272 Henry III. held a parliament at Bury. A parliament was also held here by Edward I. in 1296, when all the goods and chattels and all the revenues of the monastery were forfeited to the king, upon the monks refusing to pay a subsidy that was demanded from them; but on their afterwards complying, their goods were restored. In 1446 a parliament was convened for the purpose, as is supposed, of effecting the death of Humphrey, duke of Gloucester Henry VII. and Elizabeth both visited Bury, and were entertained here with considerable pomp and magnificence.

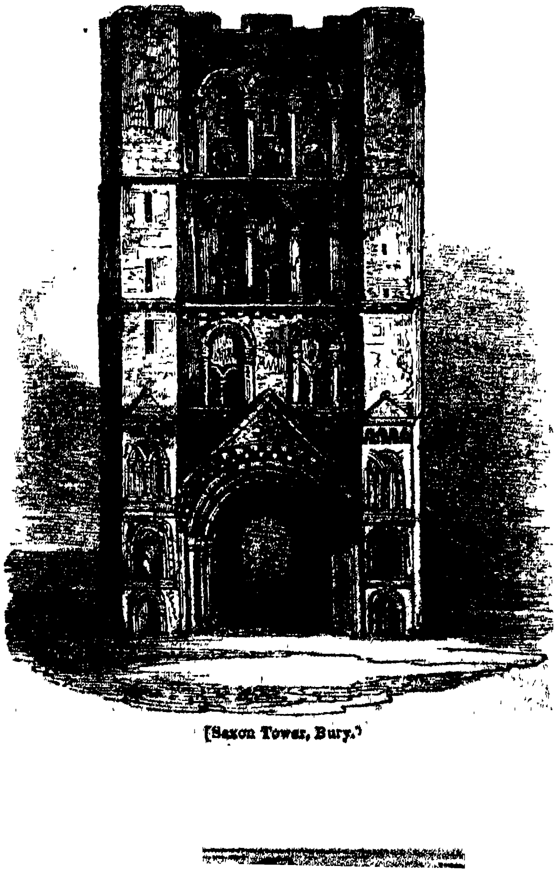
This celebrated monastery was 519 years in the possession of the Benedictine monks, and during that time had 33 abbots. At the dissolution of monasteries it was valued by the commissioners at 2366*l.* 16*s.*, but that must have been considerably under its real value, for the commissioners, in their report, say, 'we have taken in the seyd monastery in golde and sylver 5000 marks; besydes as well and rich cross with emeraldes and also dyvers stones of great value, and yet we have left the church, abbott, and convent, very well furnished with plate of sylver necessary for the same.' A writer in 1725 says that at that time the immense possessions of the abbey and its valuable privileges would have been worth 200,000*l.* per annum.

Almost the only relic which remains of the magnificence of this monastic establishment is the western, now called the abbey gate. It was erected in 1327, after the old gate was pulled down by the mob. It is a perfect specimen of Gothic architecture, combining strength and utility with elegance and grandeur. The materials and workmanship are both so excellent that, although without a roof, it is still in the highest state of preservation. Its height is 62 feet, its length 50 feet, and breadth 41 feet. In the N.W. and S.W. angles were circular stairs; those on the S.W. side still exist, but are rather difficult to ascend. The 'terre-plaine' of the wall forms a terrace all round, and over each angle there formerly was a tower.

The eastern side of this gate, although not so gorgeously splendid as the west side, is the more elegant. The internal walls are beautifully decorated, and amongst other carved work are the arms of King Edward the Confessor. Amongst other antiquities found in digging up an old foundation are four antique heads, cut out of blocks of freestone of gigantic dimensions, and probably representing some heathen deities.

Various ruins of religious and charitable institutions connected with the abbey are still visible. The following are mentioned in Dugdale's 'Monasticon':—The Hospital of St. John or God's-house without the south gate, probably the chapel, or as it is sometimes called the Hospital of St. Petronilla, was connected with this house; St. Nicholas' Hospital without the east gate, now a farm-house; St. Peter's Hospital and Chapel, founded by Abbot Anselm, in the time of Henry I., now belonging to the trustees of the free grammar school: its revenue at the dissolution was worth 10*l.* 18*s.* 11*d.* St. Saviour's Hospital, founded by Abbot Sampson in the reign of King John: it was here that the duke of Gloucester is supposed to have been murdered. St. Stephen's Hospital, Jesus' College and Guild, erected by King Edward VI. in 1481, now occupied as a workhouse; and, lastly, the convent of Grey Friars at Babwell or North Gate, established in 1256.

The Saxon Tower, or Church Gate.—This noble structure was the grand portal into the churchyard opposite to the western entrance of the monasterial church. At the dissolution it was converted into a belfry for St. James's Church, 'and to this circumstance,' says Mr. Yates, 'most probably the antiquarian is indebted for the gratification of now surveying this venerable relic of antient piety and taste.' It is considered one of the finest specimens in existence of what is called Saxon architecture. It is a quadrangular building 80 feet high, and is remarkable for its strength and simplicity. The date of its erection is unknown. The stone of which it is built abounds with small shells. Near the base on the western side are two curious bas-reliefs, one representing mankind in its fallen state, by the figures of Adam and Eve entwined with a serpent, and the other, emblematic of the delivery of man from bondage, representing God the father sitting triumphantly in a circle of cherubim. The interior of the arch presents some grotesque figures, and forms a carriage-entrance to the churchyard and the shire-house. We regret to say that several wide fissures appear on one side, and the other it is said is 12 inches out of the perpendicular. [The drawing presents a view of the west side.]


[Saxon Tower, Bury.]

Town Government, &c.—Bury is a borough by prescription, and its prescriptive rights were first confirmed by James I. in the fourth year of his reign.

The exclusive criminal jurisdiction over the whole town and one mile round it, which was granted to the abbot of Bury by Edmund, son of Edward the Elder, and is now vested in the corporation, ceases under the Municipal Corporation Act from the 1st of May, 1836. The borough courts are a court of sessions, a civil court called the court of record, a court-leet, and a court of Pie-poudre. The sessions are held three times a year, in February, June, and November, and as the county assizes are held within the town there are annually five gaol deliveries. Petty sessions are held every Thursday, and are very well attended by the magistrates. The court of record is held once a month, and embraces all pleas where the cause of action has arisen within the precincts of the borough and the damages do not exceed 200*l.* A court-leet is held once a year. There is also the court of the steward of the liberty, called the 'Much Court,' which is held once in every three weeks before the town-clerk, but which is limited to debts under 40*s.* The town is watched by night, and has an efficient police. The borough gaol has not been used since 1805. The prisoners are all confined in the county gaol which is within the precincts of the town. The property of the corporation is worth about 1016*l.* per annum, out of which they have to pay crown rents to the amount of about 58*l.* 6*s.* 6*d.* per annum, and 9*l.* to two charities. Bury first received a precept to return representatives to parliament in the 30th year of the reign of Edward I., but made no subsequent return till the 4th of James I., since which time it has always returned two members. The number of voters registered after the passing of the Reform Act was as follows:—

Householders . .	560
Burgesses . . .	30
	590

The boundaries of the borough are the same as they were formerly.

Present state of the Town, Churches, &c.—The town of Bury is pleasantly situated on the river Larke, and from its delightful walks, clean streets, and well built houses, and from the urbanity of its inhabitants, forms as pleasant a country residence as any small town we know of. A great part of the town was burnt down in 1806, but was shortly after rebuilt in its present regular manner. There is a subscription library, which contains a valuable collection of books, and four circulating libraries. The new subscription rooms on Angel Hill are very handsome and contain a well-proportioned ball-room, card-rooms, billiard-room, &c. There is also a subscription coffee-room and billiard room. A new theatre was built in 1819, and the old one has been converted into a concert-room. The entrance to the botanic garden is through the abbey gate, and the walls that surround it are part of the old walls of the monastery. The river Larke flows at the bottom of the garden. The collection of exotic plants, which is already pretty good, is rapidly increasing.

St. Mary's Church was begun in the year 1424, and was completed in about nine years; it is 130 feet long, exclusive of the chancel, which is 74 feet by 68 and 67½ in breadth. It has three aisles, which are divided by two rows of the most elegant columns. The height of the middle aisle is 60 feet, to which circumstance its beautifully carved roof owes its present existence, it being too lofty for the Puritans to exercise their fury on. The roof of the chancel is exceedingly beautiful, the ground being blue and the carved work guilt; it is supposed to have been brought from Caen in Normandy. On the north side of the communion table is a marble slab erected to the memory of Mary Tudor, third daughter of King Henry VII. of England, who first married Louis XII. of France and subsequently Charles Brandon duke of Suffolk. The monument which inclosed the body was for some time supposed to be only a cenotaph, but in opening it, in 1731, a covering of lead containing a body was found with the following inscription upon it:—

Mary Queene
1533.
of Ffranc.
Edmund H.

In the middle of the chancel lies buried John Reeves, the last abbot of Bury, and on each side is a handsome altar-monument: one to Sir William Carew, who died in 1501, and his wife who died in 1525; and the other to Sir Robert Drury.

The church is surmounted by a fine Norman tower, containing a very good set of bells. The northern porch is handsome, and the exterior of the southern aisle is particularly beautiful.

St. James's Church, like St. Mary's, is built of freestone, and is a very handsome building. It was not completed till the Reformation, when Edward VI. gave 200*l.* towards its completion. Its length is 137 feet, and its breadth 69 feet. Near the western door are two handsome monuments, one to the Right Honourable James Reynolds (Chief Baron of the Exchequer), who died in the year 1738, and another to Mary, his wife, who died in 1736. Both the livings are in the patronage of the corporation of Bury. The net income of St. Mary's is 110*l.* per annum; that of St. James's 106*l.* per annum.

The Churchyard is of considerable dimensions, and has a beautiful avenue of lofty lime-trees. It contains both churches, the Saxon tower, abbey ruins, Clopton's hospital, the shire-house, and the mausoleum; the latter was formerly 'the Chapel of the Charnel,' where it is said Lydgate the poet resided. Not many years since it formed the residence and workshop of a blacksmith. It is surrounded by shrubs, and forms an interesting object from the number of tombs grouped together.

The Shire Hall, a neat modern building, is situated on the antient site of St. Margaret's church, and contains two good-sized courts, which have but one inconvenience, that is, having no internal communication. The Guild-hall, where the borough-courts are held, is a handsome structure, built of flint and freestone.

The County Gaol, about half a mile from the south end of the town, is built on the radiating principle, and is surrounded by a wall twenty feet high, inclosing an octagonal area, the diameter of which is 292 feet. The keeper's house, which is an octagon and stands in the centre, is so elevated above the rest that from his windows he can command the whole building. In the centre of his house is a chapel, divided off into numerous partitions, so that the different classes into which the prisoners are divided and subdivided are kept separate and cannot even see each other. Upon the whole, for its accommodations and internal regulations, this gaol is one of the best in the kingdom. Two tread-mills have lately been added to it. The house of correction is near the gaol, and is equally well managed, being under the superintendence of the same keeper. It at present only contains female prisoners, all the men being confined in the gaol.

Part of the town is well paved, but the principal streets are Macadamized. It is well lighted, and has a sufficient supply of water. About a mile from the town the river Larke becomes navigable to Lynn, whence coals and other commodities are brought in small barges. The market-days are Wednesday and Saturday; the latter for meat and poultry, the former for corn, &c. Fairs are held on the Tuesday in Easter week, and on the 1st of October and 1st of December, for horses, cattle, cheese, &c. But the great fair, which is justly celebrated, generally commences about the 10th of October, and lasts about three weeks.

Bury St. Edmund's contains 2292 houses, of which 2231 are inhabited. The population in 1831 was 11,436, out of which 6190 were females. There are 2492 families, nearly all engaged in agriculture and retail trade. The assessed taxes are 4993*l.*

The Grammar-school, which is a neat modern building, with a commodious house adjoining it for the master, was founded by King Edward VI., whose bust is placed over the door with an appropriate inscription. It has four exhibitions of 20*l.* each, and two of 25*l.* each, per annum, to either of the universities, a scholarship at Corpus Christi, and another at Jesus-college, Cambridge. A new school-house has lately been erected. There are now about 100 boys on the foundation.

Bury also possesses three charity-schools, in one of which forty boys, and in another fifty girls are instructed and clothed. They are supported partly by subscription and partly by an endowment of 70*l.* per annum; as well as two Lancasterian schools, one for boys, the other for girls, established in 1811; and 98 almshouses, founded by different persons, amongst whom the principal benefactors were Mr. Edmund King and Mrs. Margaret Drury. They are under the superintendence of trustees, and their funds altogether amount to about 2000*l.* per annum. Poley Clopton, M.D., founded an hospital (called Clopton, after the founder) for the support of six aged widowers and widows, and endowed it with property worth 200*l.* per annum. It is a neat brick building, with the arms of the founder over the principal entrance. A large erection, built by the government for an ordnance depôt, has been purchased and converted into a general hospital, which is supported by voluntary contributions, and now contains about forty patients.

There is a Roman Catholic chapel, a place of worship for Baptists, the society of Friends, Methodists, and Unitarians, and two for Independents. A mechanics' institute has recently been established.

Amongst other men of note who were born at Bury St. Edmund's was Bishop Gardner. John Lydgate, commonly called 'the Monk of Bury,' spent the greatest part of his life in this place.

About three miles from Bury is Ickworth, the magnificent seat of the marquess of Bristol. It is a circular house, 140 feet in height and 90 feet in diameter, in the centre of a park which has a circuit of 11 miles. (*Communication from Bury.*)

BUSA'CO, SERRA DE, a mountain-ridge in the province of Beira in Portugal, stretching from the right or N. bank of the Mondego in a N. direction for about 8 miles. It joins at its N. end the Serra de Caramula, an offset of the great Serra de Alcoba, which runs in a N.E. direction, and divides the waters of the Vouga from those of the Mondego. The road from Viseu to Coimbra passes over the Serra de Busaco. The sides of the mountain are very steep, and partly covered with woods; the summit is a naked plateau, from which there is an extensive view over the country around, and to the W. as far as the sea. On the highest point of the Serra is a convent of monks. A battle was fought on the 27th September, 1810, at Busaco between the English and Portuguese on one side and the French on the other. The French army, 65,000 strong, under Marshal Massena, advanced by Viseu and the right bank of the Mondego towards Coimbra. Lord Wellington, with about 20,000 British and as many Portuguese troops, took up a position on the Serra de Busaco. The French advanced in three columns, one of which succeeded in reaching the summit of the hill, but while in the act of deploying was charged by some English regiments and driven down the hill with great loss. The other two columns were likewise unsuccessful. The French had about 4000 men killed, wounded, and taken prisoners, and they lost the eagle of one of their regiments; one of their generals was killed, and another taken prisoner. The loss of the allies was about 1300. Marshal Massena, unable to force the position of Busaco, tur[illegible] a mountain-pass over the Serra de Caramula, which [illegible]s troops to Sardão in the plains of the Vouga near th[illegible] and on the high road from Oporto to Coimbra. L[illegible]lington then withdrew his army to the S. of the M[illegible], and began his retreat to the lines of Torres Vedras. [illegible]n the 1st of October, the French entered Coimbra, which had been deserted by its inhabitants. It was at the battle of Busaco that the Portuguese troops, recently drilled and disciplined by British officers, were first placed in line by the side of the English, and the result of the experiment proved most favourable. (Colonel

Napier's *History of the Peninsular War; Annals of the Peninsular Campaigns.*)

BUSBE'QUIUS, A. G., a celebrated traveller and ambassador of the 16th century. His real name was Auger Gislen de Busbec, which, according to the practice of his age and country, was Latinised into Augenius Gislenius Busbequius. He was born at Comines, a town in Flanders, on the river Lys, and was the illegitimate son of the lord of Busbec, a nobleman of antient family, who brought him up in his own house, and spared no care or expense in his education. The boy made such rapid progress in his studies; and his disposition, person, and abilities, were so promising, that his father became very fond of him, and was induced to apply to his sovereign, the great emperor Charles V., for a rescript of legitimacy in his favour. The rescript, which declared young Busbequius as good as one born in wedlock, was obtained in the usual manner, by paying a round sum of money for it. When he grew up, Busbequius was sent to study in the best schools and universities on the continent—to Louvain, Paris, Venice, Bologna, and Padua; at which several places he associated with the most learned professors and distinguished men of his times. Having finished his academical studies and returned from Italy, he visited London, where he passed some time with Don Pedro Lasso, ambassador at the English court from Ferdinand, then titular king of the Romans, but shortly afterwards Ferdinand I., Emperor of Germany. Busbequius probably joined Don Pedro with the view of learning some of the routine and practical parts of diplomacy, and was what we now call an *attaché* to the embassy. During his stay in England he was present as one of the ambassador's suite at the solemnization of the marriage between Philip II. of Spain and Queen Mary of England, in 1554. Shortly after this he returned to Flanders. His reputation for ability, knowledge, and experience in public affairs stood so high, and his friends at the court of Vienna were so influential, that on the 3rd of November of the same year he received a letter from Ferdinand, advising him that he was destined for the important post of ambassador to Constantinople, and that he must begin his journey immediately. Busbequius accordingly mounted on horseback (for there was then no other mode of making the journey), and rode from Brussels to Vienna through very bad weather and detestable roads. Having received his dispatches and instructions from King Ferdinand, he set out with boldness and alacrity for Constantinople, although the circumstances of the case would have been sufficient to deter most persons. The Turks were then at the height of their power, intolerance, and insolence; they had conquered Transylvania, and nearly all Hungary; they were within a few days' march of Vienna, where their mere name spread terror; and the reigning Sultan, Solyman the Great, or Magnificent, was fierce and unrelenting, and accustomed to treat the envoys of Christian powers who did not please him in a very summary manner. On arriving at Constantinople, he found that the sultan was with his army at Amasia, in the interior of Asia Minor. As his commissions did not permit delay, he crossed over into Asia, and rode on to Amasia, where he staid a considerable time, and had several audiences of the Great Solyman, with whom he succeeded in concluding or rather prolonging a truce for six months. He rode back to Vienna, where he arrived in August, 1555.

In November of the same year he was again sent as ambassador to Constantinople. This time Solyman was at his capital, where Busbequius took up his residence for nearly seven years. At first he had many difficulties to encounter from the pride and obstinacy of the Turks: 'For you must know,' he says in one of his epistles, 'that a long series of happy success hath so elevated the minds of this people, that they make their own wills, forsooth, the sole rule of all reason, right or wrong.' But Busbequius showed admirable tact and temper, and at the end of his long mission concluded an advantageous treaty with Solyman.

In 1562 he returned to Vienna, and was soon after appointed governor and tutor to the sons of Maximilian, then king of the Romans. Though attached to the pleasures of private life and literary ease, he became more and more involved with courts and princes. When Maximilian's daughter, the Princess Elizabeth, was married to Charles IX. king of France, he was commissioned by the court to accompany her to Paris. The young queen appointed him intendant of her household and of all her affairs, and, when, on the premature death of her husband, she quitted France, she left Busbequius at Paris as her agent and representative. When the Emperor Rodolph ascended the throne of the Cæsars, he appointed him his ambassador to the French court, where Busbequius remained until 1592. Having then obtained permission to visit Flanders, his native country, in order to put his estates and private affairs in order, he left the French court and took his way through Normandy. Unfortunately it was a time of trouble and civil war. The faction of the League were in arms against the government, and occupied or over-ran a good portion of the kingdom. Busbequius had very properly furnished himself with passports from both parties, from the Leaguers as well as from the court, but his passes did not save him from being robbed and ill-treated by a party of Leaguers at Cailli, a village in Normandy, about three leagues from Rouen. On representing to them the inviolable and sacred rights attached to his character as ambassador, the brigands set him at liberty, and even restored the bulk of his baggage. But Busbequius, now an old man, had received a shock from which he did not recover. Instead of continuing his journey into Flanders, he ordered his attendants to convey him to the house of Madame de Maillot, at Saint Germain, close to Rouen, where he died in a few days, on the 28th of October, 1592. Philip Camerarius, Joseph Scaliger, and other writers, assert that he was murdered by the robbers, but the well authenticated facts regarding his death are what we have stated.

The body of Busbequius was honourably interred in the church of the place where he died, and his heart was carried to Flanders to be placed in the tomb of his ancestors.

As a literary character and a man of refined taste, this distinguished diplomatist occupies a very honourable place. The letters in which he describes his two journeys into Turkey, his residence at the court of Solyman, &c., which are in Latin, and were published under the title of 'Augerii Gislenii Busbequii Legationis Turcicæ Epistolæ Quatuor,' are admirably written, and abound in information which will always be interesting, and which was of great political utility at the time he wrote, when the cabinets of Europe knew not what to make of the Ottoman Porte. He thoroughly understood the state of the Ottoman empire, which was then the bugbear of Europe, and he laid down a judicious system for resisting and attacking it, in a treatise entitled, 'De Re Militari contra Turcam instituendâ consilium.' The orations which he delivered in France to the different French kings have been very much praised, but we cannot speak of these of our own knowledge. Besides contributing to various scientific and literary works, Busbequius was the author of some interesting letters on the state of France under the reign of Henry III., and on the expedition of the duke d'Alençon to the Low Countries. These letters, addressed to the Emperor Rodolph, were first published in 1632.

Notwithstanding the constant labours of correspondence and diplomacy, he found time, while in Turkey, to collect inscriptions, coins, manuscripts, rare plants, and other specimens of natural history. On his second embassy he engaged and took with him an artist to make drawings of curious botanical and zoological specimens, at that time little known in the west of Europe. The fruits of his taste, judgment, and liberality frequently appear in the works of Gruterus, Mathioli, and other contemporary writers.

Busbequius spoke seven languages—Latin, Italian, French, Spanish, German, Flemish, and Sclavonian in perfection. He always wrote in Latin; and the Latinity of his Turkish travels has been much admired by scholars. This book, which has appeared in all the modern languages of civilised Europe, was translated into English, and went through several editions in the course of the last century. A very good edition, with index, was published at Glasgow by Robert Urie in 1761. The title is 'Travels into Turkey. Translated from the original Latin of the learned A. G. Busbequius.' (Busbequius's works, as named above; Bayle, *Dictionnaire Historique et Critique*; and Guicciardini's *Italian Hist.*)

BUSBY, RICHARD, second son of Richard Busby, of the city of Westminster, was born at Luton in Northamptonshire Sept. 22, 1606. Having passed through Westminster school he was elected student of Christchurch, Oxford. So low were his finances that his fees for the degrees of bachelor and master of arts were defrayed by donation from the parish of St. Margaret, Westminster, 5*l.* having been given him for the former, and 6*l.* 13*s.* 4*d.*

for the latter. This favour he gratefully acknowledged in his will by leaving 50*l.* to the poor housekeepers in that parish, having already bequeathed to the parish for charitable purposes an estate of 525*l.* per annum, and very nearly 5000*l.* in personal property. In 1639 he was admitted to the prebend and rectory of Cudworth in the church of Wells, and on the 13th of December in the following year he was appointed head master of Westminster school, in which occupation he laboured during more than half a century, and by his diligence, learning, and assiduity has become the proverbial representative of his class. In July, 1660, he was installed as prebendary of Westminster, and in the following August he became canon residentiary and treasurer of Wells. At the coronation of Charles II. in 1661 he had the honour of carrying the ampulla. His benefactions were numerous and most liberal. He died April 6th, 1695, full of years and reputation, and was buried under a suitable monument in Westminster Abbey. His works were principally for the use of his school, and consist for the most part either of expurgated editions of certain classics which he wished his boys to read in a harmless form, or grammatical treatises, chiefly in a metrical form. The severity of his discipline is traditional, but we do not find that it rests upon any sound authority; and strange as it may appear, no records are preserved of him in the school over which he so long presided. The accusation of 'devilish covetousness' brought against him by the gossiping Pepys (*Memoirs*, iii. 211) is sufficiently disproved by the munificence of his will, in which he did not capriciously endow public institutions which accident suggested to him on a deathbed, but fulfilled a design long entertained of bequeathing sums to be employed in useful purposes by the heads of those places of education to his connexion with which he was indebted for all his wealth.

BÜSCHING, ANTON FRIEDRICH, was born at Stadthagen, in Westphalia, studied at Halle, and afterwards went to Petersburg as tutor to the children of Count Lynar, the Danish ambassador to the court of Russia. He was early struck with the want of good geographical works in his time, and he applied himself to supply the deficiency. Having gone to Copenhagen, he published, in 1752, a description of the duchies of Holstein and Sleswick, which was much approved of. In 1754 he was appointed professor of philosophy at Göttingen, and would have obtained the chair of theology in that university but for a treatise in which he expressed opinions which were considered as swerving from Lutheran orthodoxy. About 1760 he was elected pastor of the German Protestant church at Petersburg, where he remained four years, and founded a Lyceum, which soon became one of the best institutions for education in the Russian capital. Having disagreed with Count Münich, who was protector of the German church, he left Petersburg in 1765, notwithstanding the solicitations of the Empress Catherine, who wished to retain him in Russia. In 1766 he was appointed Director of the gymnasium of Grauen Kloster, at Berlin. He composed for that institution a number of elementary works, which became very popular in North Germany.' Büsching however is more generally known for his 'Neue Erdbescreibung' or Universal Geography, the first part of which appeared in 1754. In 1759 he had completed the description of Europe in eight volumes, which became a standard work. He was one of the first modern writers who introduced in a work of descriptive geography statistical information on the wealth, industry, commerce, and institutions of the various countries. His statements were made after careful inquiry, and were generally accurate. Büsching's description of Europe was translated into English—'A new System of Geography,' 6 vols. 4to., London, 1762. His account of the northern countries, Denmark, Norway, Sweden, the Netherlands, and Germany, is the most full and elaborate part of the work. Germany, in particular, is treated very minutely, and occupies about one-half of the whole. It was translated into French under the title 'Atlas Historique et Géographique de l'Empire d'Allemagne,' 4 vols. 4to. It is still valuable as a book of reference about the late German empire. Busching's whole work went through eight editions in his lifetime, and was translated into the principal European languages. In 1768 he published the 1st vol. of Asia, which treated of Asiatic Turkey and Arabia, but went no further with it. He published also 'Magazin für die neue Historie und Geographie,' 23 th. 4to., Hamburg and Halle, 1767-93.—'Nachrichten von dem Zustande der Wissenschaften und Künste in dem Dänischen Reichen und Ländern,' 3 vols. 8vo., Copenhagen, 1754-65; besides numerous other works of geography, biography, education, and likewise on religious subjects. His 'History of the Lutheran Churches in Russia, Poland, and Lithuania,' has been mentioned with praise. Of his biographies, that of the great Frederic has been translated into French by D'Arnex—'Caractère de Frederic II.' 8vo., Bern, 1788. Büsching was a most indefatigable writer, honest and independent; and he laboured earnestly for the advancement of education and general information. The Prussian government afforded him encouragement and support; and in his latter years his correspondence, which was very extensive, was made free of postage charges. He died at Berlin, in May, 1793.

BUSHEL. This word seems to be a diminution of an old English word *buss*, signifying a box or vessel, and still used for small fishing-boats. In Matthew Paris (cited by Ducange) there is *Busheles* as a Latin plural. In middle Latin there is *bussellus, buschellus, bustellus* (whence *bouteille, bottle,* and *pottle*), and *butticella* from *butta* (butt). The latter word, the origin of all, so far as the Latin is concerned, was a general measure,—of land, for instance. [Ducange.]

Fleta describes the bushel as containing eight pounds (libræ) of corn, and eight bushels as making a quarter (quarterium): Spelman, as containing four gallons (galones) of wine. Dr. Bernard asserts the bushel to be 72 pounds troy of common corn (triticum), or 59·1667 avoirdupois. By the act of 1697 the Winchester round bushel was to be 18½ inches in internal diameter and eight inches deep, or 2150·42 cubic inches. The standard of length implied was the old exchequer standard. By the act of 1824 the standard gallon contains 10 pounds avoirdupois of pure water, eight such gallons make a bushel, and eight bushels a quarter. This, by the other provisions of the act, made it contain 2218·2 cubic inches very nearly. The content of the bushel seems to have been gradually increasing. Arbuthnot (1727) makes it 2178 cubic inches; Eisenschmidt (1737) 2180·4 cubic inches. The bushel is now 36·347 French *litres*. The *heaped* bushel, for goods which were heaped above the measuring vessel, such as coals, fruit, &c., and which was estimated at 2815·5 cubic inches, was abolished by 4 and 5 Will. IV. cap. 49, an act which took effect from the first of January, 1835. [WEIGHTS AND MEASURES.]

BUSHIRE. [ABOUSHEHR.]

BUSHMEN. [BOSJESMANS.]

BUSKIN, a covering for the leg, commonly a strong outer garment, fit for a defence against dirt, thorns, &c. This word is also used in English as the translation of the Greek and Latin word *cothurnus*, which signifies a high-heeled shoe or boot used by the Greek and Roman tragic actors to give an appearance of elevation to their stature, in conjunction with the mask and other stage properties. *Cothurnus* in Latin is employed in contradistinction to *soccus*, the flat-soled shoe worn by comedians. Hence in English authors the words *buskin* and *sock* are often used for the tragic and comic drama. So Dryden,

> 'Great Fletcher never treads in buskins here,
> Nor greater Jonson dares in socks appear.'

BUSSAHER or BUSSAHIR, a principality in Northern Hindustan, occupying a mountainous tract on both sides of the Himalaya range. Bussaher is bounded on the N.W. by the Sutleje, on the S. and S.E. by the Jumna, on the S.W. by Sirmore, and on the N. and E. it extends to the empire of China. Over a considerable part of this territory, the boundaries of which are but imperfectly known, the rajah of Bussaher exercises only a kind of feudal superiority, the rulers of the petty states into which it is divided paying an annual tribute to him as their head. The entire principality lies between 30° and 32° N. lat., and between 77° and 79° E. long.

Bussaher is divided into the districts of Kunawur; the tract containing Rampore, the capital, and Seran; the valley of the river Paber; and Dasau, which contains the Tartar pergunnah of Hangarung. Kunawur is a rugged district between 31° 33′ and 31° 51′ N. lat., and between 77° 47′ and 78° 42′ E. long., extending on the E. to Shipke, the frontier town of Chinese Tartary, and on the W. to Hangarang. The Keubrang pass in the Himalaya Mountains, which is 18,180 feet above the level of the sea, forms the boundary between Kunawur and Chinese Tartary where the latter country is under the dominion of the grand lama of Lassa. The N. extremity of Kunawur is at Shialkur, a hill fort near the river Spiti in 32° N. lat. and 78° 34′ E. long., the level of which is 10,113 feet above the sea. The climate of this district is cold, and a great part of the soil is uncultivable, being composed of eminences covered with snow, with chasms between them inaccessible to the husbandman. But little grain is raised, and the chief employment of the population is breeding and rearing sheep, goats, ponies, asses, and mules. The wool which is produced is exported in considerable quantities, and the greater part of the animals here named, including sheep and goats, are used as beasts of burthen in carrying on the traffic with Hindustan, Tibet, Cashmere, and Nepaul. The inhabitants engage largely in trade and enjoy a good reputation for honesty and punctuality in their dealings. The villages are neither numerous nor populous, the largest not containing more than 100 inhabitants; several of them exhibit the appearance of wealth and civilization. The majority of the inhabitants are Hindus, but in some of the villages the people are adherents of the grand or Dalai Lama of Lassa.

Rampore, the capital of the principality, is situated in 31° 27′ N. lat. and 77° 38′ E. long.; on the left bank of the Sutleje, where that river is little more than 200 feet wide, and confined by lofty precipices, between which the water foams and dashes furiously. The passage across the stream is effected by a bridge of ropes, traversed by a block of wood, upon which the traveller sits and is drawn across. Rampore is considered a place of much sanctity, and is therefore at all times greatly frequented by religious mendicants: it contains several temples. The town has much fallen off from its former prosperity, and contains only about 150 stone and slated dwellings: it is the usual place of residence of the rajah, who has also a summer palace at Seran, about 22 miles higher up the river. This residence of the rajah is on a hill three miles from the banks of the Sutleje, and 4500 feet above its level.

The third district, that which contains the valley of the river Paber, is the most productive part of the principality, but some portion even of this is wild and barren. Iron ore is found in this district, and is worked, when the iron forms an article of export to the Seik countries. Dasau produces wheat and barley, but not rice. Near the villages and in sheltered spots, apricots, gooseberries, and currants are found, but the trees and bushes are stunted. The greatest part of the wealth of the inhabitants consists of ponies and mules. Manufactures of coarse blanketing are carried on in the district. In other parts of Bussaher woollen cloths of a superior texture are made, the wool being of excellent quality; a small quantity of shawls are likewise made of goat's and sheep's wool mixed.

Bussaher receives from Hindustan sugar, cotton, hardwares, and indigo, and makes returns in iron, opium, tobacco, turmeric, and blankets. From Tibet and the Chinese territories are brought shawl-wool, salt, tea, silk goods, musk, and borax: the returns are grain, iron, and opium, cotton cloths, indigo, and other articles received from the lower parts of Hindustan.

The principality was conquered in 1810 by the Gorkas, and remained subject to them until 1814, when it was, through the armed intervention of the British, restored to the rajah, who, by a sunnud or treaty, dated in November, 1815, was made to contribute an annual sum of 15,000 rupees towards the expense of the force maintained by us; four forts on the banks of the Paber were retained by the British as stations for the protecting troops, and in the event of war, the rajah of Bussaher bound himself to place his troops under the orders of the British. The whole principality is thinly inhabited, but no attempt has been made to ascertain the actual population. (*Reports of Committee of House of Commons*, 1832.)

BUSSY D'AMBOISE, LOUIS DE CLERMONT DE, one of the favourites of the Duke d'Anjou, brother of Henry III., king of France. Little is known of this minion but the history of his desperate bravery and his crimes. During the massacre of St. Bartholomew, having joined the assassins, he murdered with his own hand his relation, Antoine de Clermont, with whom he had a law-suit for the marquisate of Rénel; but the edict which soon afterwards passed in favour of the Huguenots deprived him of any profit from this bloody deed. He afterwards commanded at Angers, where his exactions rendered him most unpopular; and having long interrupted the tranquillity of Paris by private brawls and combats, in which he set at nought the terrors of the Bastile and the authority of the king, he became so odious to Henry III. by frequent acts of presumption, that he gave information to Charles de Chambes, Count of Montsoreau, of an intrigue which Bussy carried on with his wife. The secret had been revealed to the king by his brother of Anjou, to whom Bussy had jestingly written in one of his letters that he 'had the game of the mighty master in his toils.' Montsoreau compelled the wretched adulteress to write a letter with her own hand, making an assignation in the Château de Coustancieres, where the injured husband awaited Bussy with a numerous ambuscade of armed men, and, in spite of a most courageous resistance, put him to death on August 19th, 1579. (De Thou, lxviii. 9.)

Brantôme (*Discours*, lxxxv.) has made what he calls an *éloge* of Bussy. It contains nothing more than anecdotes of his pugnacity, which the writer mistakes for true courage, and a frightful picture of the misrule and demoralization of the reign of Henry III. A single line in the epitaph of Bussy, which is there given, conveys a finished portrait of his character:—'Son plaisir fut sa mort, ses plaisirs ses combats.'

BUST, in sculpture, means a statue truncated below the breast. The etymology of the word is not very clear. The Romans called 'bustum' the place where they burnt the bodies of the dead, from 'bustum,' burnt. Bustum was was afterwards used for the grave in which the body was buried; and lastly, in the latinity of the lower ages, for the dead body itself: 'Sanctorum busta,' the bodies of martyrs (Ducange). Bustum seems to have been used more especially for the trunk of the body without the head: 'Quinque hominum busta sine capite cæsa.' (*Annal. Mediolan.* in Muratori.) In the old French, 'bu' meant the trunk: 'Car ils ont bien armé le chef et le bu.' (*Old French Romance*, Ducange.) 'Busto,' in Spanish and Italian, has a similar meaning. The Italians call also 'busto' the stays which embrace and support the breast. In sculpture, however, bust includes the head, shoulders, and breast, with the arms truncated above the elbow, and as such, it forms a large department of the art. Busts were mostly used by the antients to represent likenesses of individuals, and were placed either upon sepulchral monuments, or in the interior of houses, or in gardens. The Greek word *Hermæ* has been sometimes considered as synonymous with the modern bust, but the Hermæ were merely heads placed on a block of stone.

BUSTAR, a district and town in Gundwana, the latter situated in 19° 31′ N. lat. and 82° 28′ E. long. The part of the country in which this district occurs has been very little explored; it is difficult of access, and so unhealthy as to discourage the visits of travellers. This district is occupied by a branch of the range of mountains that runs through the Circars parallel to the bay of Bengal. Nearly the whole of the country consists of hills covered with jungle, and of unhealthy morasses; the remainder, constituting not more than one-fifteenth part of the entire area, is very imperfectly cultivated by the scanty population, who live almost in a state of nature, and subsist on the produce of the chase. The principal river in Bustar is the Inderowty or Indravati, which is not navigable owing to the rocks in its bed. The forests of this district abound with teak trees large enough for ship-building; and it is said, that if made into rafts they could be floated down the Inderowty to its junction with the Godavery, and thence to the bay of Bengal. The river Mahanuddy has its source in this district, and flows eastward to Sumbulpore, which district it enters a few miles east of Sri Narrain.

The inhabitants are extremely ignorant and superstitious; the practice of sacrificing human victims to the goddess Devata Iswari Devi, continued to a recent date, but has been stopped through the interference of the British. All culprits and prisoners of war, and, when this supply failed, their innocent fellow-countrymen were sacrificed at the shrine of the goddess.

The zemindar of Bustar is subject to the Nagpore state, and pays to it an annual tribute of 15,000 rupees.

BUSTARD, in Latin *Otis*, a genus of land birds whose proper position in the ornithological system has caused some embarrassment to zoologists. Temminck places it under his twelfth order, *Cursores* (Runners), observing that the genera *Struthio*, *Rhea*, and *Cassuarius* ought to stand at the head of that order. Cuvier arranges the

Bustards under the *Pressirostres*, his second family of his fifth order (*E'chassiers*,—*Grallæ*, Lin.) of birds, between the Cassowaries on one side and *Œdicnemus* (thick-kneed bustard or stone curlew) on the other. Temminck makes *Cursorius* immediately succeed it, and observes that among the species of that genus the passage between *Otis* and *Cursorius* may be possibly found. It appears that the bustards partake of the organization of the struthious, gallinaceous, and wading birds (*E'chassiers*,—*grallatores*). *Rhea*, without alluding to the *Dodo* on the struthious side, *Œdicnemus* on that of the plovers, and the turkey on the side of the gallinaceous birds, make near approaches to the genus under consideration, while the *Cariama* of Brisson (*Microdactylus* of Geoffroy, *Dicholophus* of Illiger), a South American form, seems to be one of its nearest representatives on the new continent (Cariama). Vigors places the genus in his family *Struthionidæ*—(order *Rasores*)—which occupies a position between the *Cracidæ* and the *Tetraonidæ*, while it approximates to the *Gruidæ* and *Charadriadæ* in the order *Grallatores*; and, taking all the circumstances into consideration, this seems to be the best arrangement hitherto proposed.

The bustards live generally in open countries, preferring plains or wide-spreading extensive downs dotted with low bushes and underwood, localities which give them an opportunity of descrying their enemy from afar. They are said to fly but rarely,* running from danger with exceeding swiftness, and using their wings like the ostriches to accelerate their course. When they do take wing their flight is low, and they skim along the ground with a sufficiently rapid and sustained flight. Their food consists of vegetables, insects, worms, grain, and seeds. They are polygamous, one male sufficing for many females, which, after fecundation, live solitary. Temminck says that it would seem that they moult twice a-year, and that the males in the greatest number of species differ from the females in having extraordinary ornaments, and in possessing a more variegated plumage. He further observes, that the young males wear the garb of the female during the first and second year, and adds his suspicion that the males in winter have the same plumage as the females. Cuvier notices their massy port and the slightly arched and vaulted upper mandible of their beak, which, with the little webs or palmations between the bases of their toes, recal the form of the gallinaceous birds; but he adds that the nudity of the lower part of their legs, all their anatomy, and even the flavour of their flesh, place them among the *E'chassiers*, and that, as they have no hind toe, their smallest species approach nearly to the plovers.

The following is the generic character given by Temminck, slightly modified.

Bill of the length of the head or shorter, straight, conical, compressed, or lightly depressed at the base; point of the upper mandible a little arched (voutée.)

Nostrils oval, open, approximated, distant from the base.

Feet long, naked above the knee, three front toes short, united at their base, bordered by membranes.

Wings moderate, the third quill longest in each wing.

Geographical distribution. The form occurs in Europe, Asia, and Africa; but is not developed in America.

EUROPEAN SPECIES.

Of these the *great Bustard*, *Otis*, and *Avis tarda*, of Belon and others, *Ostarde, Houtarde, Outarde, Bistarde* of the French, *Starda* and *Starda commune* of the Italians, *Der grosse Trappe, Trapp, Trappgans*, and *Ackentrapp* of the Germans, *Abutarda* (avis tarda) of the Spaniards, *Gustard* of the old Scotch, *Yr araf ehedydd* of the Welsh, and *Otis tarda* of Linnæus, will serve as an example.

From passages in the 'History of Animals' (ii. 17. vi. 6), there can be scarcely a doubt that our great bustard is Aristotle's ὠτίς (Otis). Indeed the doubts originated in a misunderstood passage in the thirty-third chapter of his ninth book; and it is clear from several authorities that the bird and the quality of its flesh were well known to the Greeks. Pliny evidently alludes to these birds as those 'quas Hispania aves tardas appellat, Græcia otidas' (*Nat. Hist.* x. 22), though he blunders about the flesh, telling an absurd story of its effects, which arises from his confounding the ὠτίς with Aristotle's ὠτός (Otus), an owl.

Description. Selby's figure of the male was taken from a particularly fine full-grown specimen, weighing twenty-eight pounds, and 'shot, about six years ago,'—the date of the volume is 1825,—by the Rev. Robert Hamond of Swaffham in Norfolk, in whose possession it then was, as well as two females, and a young bird of a month old. The following is Selby's description:—

Male.—Bill strong, greyish white; the under mandible palest. Head, nape of the neck, and ear-coverts, bluish grey. A streak of black passes along the crown of the head, reaching to the occiput. Chin-feathers and moustaches composed of long, wiry feathers, with the barbs disunited and short. Fore part of the neck clothed with a naked bluish-black skin, extending upwards toward the ear-coverts, and covering the gular pouch. Sides of the neck white, tinged with grey; lower part of the neck fine reddish orange. At the setting on of the neck, or between the shoulders, is a space destitute of feathers, but covered with a soft grey down. Scapulars buff orange, barred and spotted with black. Back, rump, and tail-coverts reddish orange, barred and variegated with black. Greater coverts and some of the secondaries bluish grey, passing towards the tips into greyish white. Quills brownish black, with their shafts white. Tail-feathers white at their bases, passing towards the middle into brownish orange, with one or two black bars; the tips often white, and, when the feathers are spread laterally, forming a segment of a circle. Upper part of the breast reddish orange; lower part, belly, and vent white. Legs black, covered with round scales. Irides reddish brown.

The gular pouch is capable of containing a considerable quantity of water, Pennant says seven pints; Montagu talks of the same number of quarts but doubts the quantity, as he well may, nor does he give any authority for the greater capacity. May not he have misread Pennant, who obtained his information from Dr. Douglas, said to have been the first discoverer of this reservoir? In a specimen mentioned by Graves, weighing twenty-two pounds and a half, the pouch was capable of containing rather more than two quarts. Dr. Douglas supposes that the bird fills this natural water-bag as a supply in the midst of those dreary plains where it is accustomed to wander; and Bewick adds that one of these birds, which was kept in a caravan, among other animals, as a show, lived without drinking. It was fed with leaves of cabbages and other greens, and also with flesh and bread. Others conjecture that this pouch is a provision for conveying water to the female during the time of incubation and to the young. It is true that the female is without this appendage; but it should be remembered that the best authorities agree in stating that the male is never seen in close company with the female excepting before incubation. Some again suppose that the use of this bag is to enable the bird to eject the water by muscular compression in the faces of birds or beasts of prey, by way of a defence. The average length of a male is three feet three inches.

Female.—Head and forepart of the neck of a deeper grey, and without the moustaches and gular pouch. Back of the lower part of the neck reddish orange. The other parts of the plumage similar to that of the other sex. Size seldom more than one-third of that of the male.

Young.—At a month old covered with a buff-coloured down, barred upon the back, wings, and sides with black.

Locality.—Johnston censures Pliny for saying that bustard is peculiar to Spain, observing that among of localities it is a native of Bœotia, in the neighbourhood of the Cephissus; and the editor of the last edition of Pennant says that the bird, still retaining its antient name (*Otis*), is found in all the great plains of Greece. Aldrovandus observes that Italy has none of these birds, unless they were brought over accidentally by tempests; but Willughby, in his text, says, 'We, when we travelled in Italy, did see in the market at Modena a bustard to be sold, whence we suspect that there are of them in that country.' In his preface however he corrects himself, saying, 'I am now persuaded that the *Stella avis* of Aldrovandus is a different kind from the bustard, and that the bird we saw in the market at Modena was this *Stella*, for to my best remembrance it was much less than a bustard, and therefore I revoke what was said in contradiction to Aldrovandus his affirmation, that the bustard is a stranger to Italy; but it is very likely that this *Stella avis* is the same with the *Anas campestris* of Bellonius.' The bird alluded to last by Willughby is the *Field-duck*; *Cane petière*, of the French, *Otis tetrax* of Linnæus, our *Little Bustard*, and

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* See, however, the habits of *Otis Tarda*, post.

Prince Bonaparte mentions it as occurring near Rome in the winter, but very rarely, and praises the delicacy of its flesh, 'Carne squisita, ricercatissima.' He omits the Great Bustard entirely, and no doubt intentionally. Yet Selby says, 'It is found in some provinces of France and in parts of Germany and Italy. It is common in Russia and on the extensive plains of Tartary;' and Temminck states that it inhabits various departments of France, of Italy, and Germany; that it is less abundant towards the north than in the south; and that it is very rarely and accidentally found in Holland. Graves relates that the species is dispersed over the southern parts of Europe, and the more temperate parts of Africa, and is very abundant in some parts of Spain and Portugal. In our own islands, the increase of population and civilisation, followed by greater demands on the land, and consequently by an extension of cultivated surface, have so reduced the bustards that, unless care be taken to preserve the few which remain, they will soon be numbered among the other extinct species of our Fauna. We will endeavour to trace the old British localities of these noble birds. 'They are called,' says Willughby, 'by the Scots *Gustardes*, as Hector Boethius witnesseth in these words:—In March, a province of Scotland, are birds bred, called in the vulgar dialect *Gustardes*, the colour of whose feathers and their flesh is not unlike the partridges, but the bulk of their body exceeds the swans.' The editor of the last edition of Pennant states that, in Sir Robert Sibbald's time, they were found in the Mers, but that he believes that they are now extinct in Scotland. Willughby also says (1678), 'On Newmarket and Royston Heaths, in Cambridgeshire and Suffolk, and elsewhere, in wasts and plains they are found with us.' Ray (1713) thus writes:—'In campis spatiosis circa Novum Mercatum (Newmarket) et Royston oppida in agro Cantabrigiensi, inque planitie, ut audio, Salisburiensi, et alibi in vastis et apertis locis, invenitur.' In Brookes's Ornithology (1761) the following passage occurs:—'This bird (the bustard) is bred in several parts of Europe, and particularly in England, especially on Salisbury Plain, Newmarket and Royston Heaths, in Cambridgeshire and Suffolk; for it delights in large open places. The flesh is in high esteem, and perhaps the more so because it is not very easy to come at.' Pennant says, 'These birds inhabit most of the open countries of the south and east parts of this island from Dorsetshire as far as the Wolds in Yorkshire.'

The editor of the last edition (1812) observes that 'the breed is now nearly extirpated, except on the downs of Wiltshire, where it is also very scarce.' The figure of the male bird given by Graves is said to have been drawn from one taken alive on Salisbury Plain in 1797. Montagu, in his Dictionary (1802), says, that in this locality it had become very rare from the great price given for the eggs and young to hatch and rear in confinement. In his Supplement (1813) he states that not one had been seen there for two or three years previous. We are old enough to remember seeing one, and sometimes two, bustards as the crowning ornaments of the magnificent Christmas larder at the Bush Inn, Bristol, in the reign of John Weeks, of hospitable memory; and we have heard, too, a romantic story of the last of the Salisbury Plain bustards (a female) coming into a farmer's barton, as if giving herself up. Graves says that, in the spring of 1814, he saw five birds on the extensive plains between Thetford and Brandon, in Norfolk, from which neighbourhood, in 1819, he received a single egg, which had been found in a large warren. In the autumn of 1819, he adds, a large male bird, which had been surprised by a dog on Newmarket Heath, was sold in Leadenhall Market for five guineas; and in the same year, he continues, a female was captured, under similar circumstances, on one of the moors in Yorkshire. When the mania for real British specimens of birds was prevalent, the bustards suffered not a little. We know a collector who, about the year 1816, had nine dead bustards before him together; they came from Norfolk. Bustards have been heard of within these last few years on North Stow Heath, near Culford, in the neighbourhood of Bury St. Edmund's; and we are happy to be able to state that in the locality from whence Selby obtained his specimen, the bustard is still in existence and most carefully preserved. In this, the western part of Norfolk, a nest is generally hatched off every year. In the summer of 1834, a nest of three eggs was hatched in an open corn-field about half a mile from High House; and, in December in that year, three great bustards were seen about a mile from it. They shift about from place to place, and are seldom seen but in the open country. We earnestly hope that every one, sportsman or no sportsman, will respect this little remnant of the numerous flocks which once graced our island, and second the endeavours of the spirited owner of the property on which they have found refuge, to save the breed of this noble bird from utter extinction in England. In the eastern part of the county we fear that it is quite lost, though it was comparatively common some time ago. It is the more necessary to impress on our readers the importance of abstaining from the preserved few above alluded to, because there is not much hope of replenishing the breed by captive birds. Graves's male bird above mentioned lived about three years in confinement; and, though a female was procured from the continent, she never laid while confined. These birds ate turnip, cabbage, and lettuce leaves, also the blades of young corn; during the winter they were fed with grain, which they always preferred when soaked in water; they would likewise devour worms and slugs.

Food.—Willughby says that the bustard feeds upon corn, seeds of herbs, colewort, dandelion leaves, &c. In the stomach of one which he dissected he found a great quantity of hemlock-seed, with three or four grains of barley, and that in harvest time. Brookes states that they feed upon frogs, mice, small birds, and different kinds of insects. Pennant makes their food to consist of corn and other vegetables, and those large earth-worms that appear on the Downs before sun-rising in the summer. Montagu states it to be green corn, the tops of turnips, and various other vegetables, as well as worms; but adds, that they have been known to eat frogs, mice, and young birds of the smaller kind, which they can swallow whole. Turnip-tops are certainly a favourite article of diet with these birds; and we believe that the nine bustards above-mentioned owed their fate to their fondness for this vegetable—being laid in wait for at their feeding-time. Temminck says that their nourishment consists very much of insects and worms, and also of grain and seeds.

Propagation.—The eggs, two in number generally, sometimes three, are laid upon the bare ground, which is often a little hollowed out by the female (occasionally, says Selby, among clover, but more frequently in corn-fields), early in the spring. They rather exceed those of a turkey in size, and their colour is a yellowish brown, inclining to oil-green, with slight darker variations. Time of incubation four weeks. The young as soon as hatched follow the parent, but are incapable of flight for a long time.

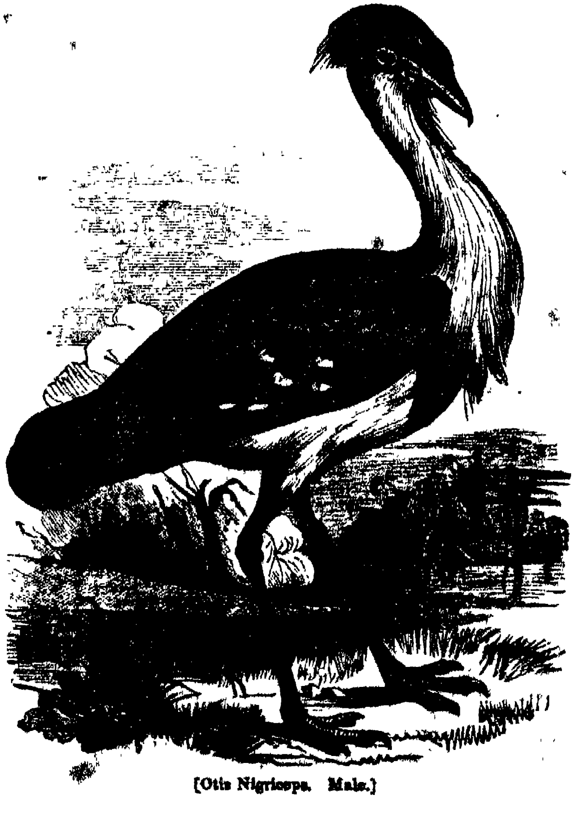
Habits.—The extreme rapidity of their running, and the unwillingness to rise on the wing exhibited by these birds, have been the theme of most ornithologists. We have also many accounts of their being coursed with dogs. The following is from Brookes:—'There are also bustards in France, which frequent large open plains, particularly near Chalons, where, in the winter-time, there are great numbers of them seen together. There is always one placed as a sentinel, at some distance from the flock, which gives notice to the rest of any danger. They raise themselves from the ground with great difficulty; for they run sometimes a good way, beating their wings before they fly. They take them with a hook baited with an apple or flesh. Sometimes fowlers shoot them as they lie concealed behind some eminence, or on a load of straw; others take them with greyhounds, which often catch them before they are able to rise.' Selby, who has evidently had good opportunities of observation, thus writes in his Illustrations:—'Although in a state of confinement the bustard becomes tolerably tame to those who are in the habit of attending it, yet it displays at all times considerable ferocity towards strangers; and all attempts to continue the breed in that state have been without success. With respect to its habits in the wild state, it is so shy as seldom to be approached within gun-shot; invariably selecting the centre of the largest inclosure, where it walks slowly about, or stands with the head reposing backwards upon the bare part of its neck, and frequently with one leg drawn up. Upon being disturbed, so far from running in preference to flight (as has been often described), it rises upon the wing with great facility, and flies with much strength and swiftness, usually to another haunt, which will sometimes be at the distance of six or seven miles. It has also been said, that in former days, when the species was of common occurrence, it was a practice to run the young birds (before they were able to fly) with greyhounds. So far from this possibility existing with the present remnant of the breed, the young birds, upon being alarmed, constantly squat close to the ground, in the same manner as the young of the lapwing, golden plover, &c., and in that position are frequently taken by hand; indeed this is even the habit of the female during incubation.' Selby's remarks on its powers of flying are corroborated by the 'Booke of Falconrie or Hawking' (1611), where under the head of 'Other flights to the field called great flights,' at p. 83, we find it thus written:—'There is yet another kind of flight to the fielde, called the great flight, as to the cranes, wild geese, bustard, bird of paradise, bittors, shovelars, hearons, and many other such like, and these you may flee from the fist, which is properly tearmed the source. Neverthelesse, in this kind of hawking, which is called the Great Flight, the falcons or other hawks cannot well accomplish their flight at the cranes, bustard, or such like, unlesse they have the helpe of some spaniell, or such dogge, wel inured and taught for that purpose with your hawke. Forasmuch as great flights require pleasant ayde and assistance, yea and that with great diligence.' As an article of food the flesh of the bustard is held in great estimation. It is dark in colour, short in fibre, but sweet and well flavoured. In the last edition of Montagu's Dictionary it is stated, that in 1804 one was shot and taken to Plymouth market, where a publican purchased for a shilling what would have fetched two or three guineas where its value was known. It was however rejected at the second table as improper food, in consequence of the pectoral muscles differing in colour from the other parts of the breast, as in some of the grouse. There were country gentlemen supping at the inn on the following evening, and hearing of the circumstance, they desired that they might be introduced to the princely bird, and partook of it cold at their repast. The bustard seems, with accidental exceptions, to have always brought high prices. We do not indeed find it at the feast given at the 'intronazation' of George Nevell, Archbishop of York, in the reign of Edward IV.; but, in the Earl of Northumberland's household book, it appears among the birds appropriated to his lordship's table; it has no price placed opposite to it, as in the case of all the other birds with one other exception.

[Otis Tarda. Male.]

[Otis Tarda. Female.]

Asiatic Species.

We select *Otis nigriceps* as an example. The specimen from which the figure in Mr. Gould's magnificent work ('Century of Birds from the Himalaya Mountains') was taken, was brought from the highlands of the Himalaya; but it is by no means confined to that locality. Col. Sykes observed it in the wide and open country of the Mahrattas, where it lives in large flocks, and where it is considered one of the greatest delicacies as an article of food. It is indeed so abundant in the Deccan, that Col. Sykes records, in the



[Otis Nigriceps. Male.]

Proceedings of the Zoological Society, that one gentleman shot nearly a thousand.

Description. Male.—Body above, pale bay, lightly undu'ated with rufous-brown; neck, a few spots on the wings, and belly, white; the head, which is crested, the outer wing-coverts, the quills, and the large mark on the breast, black; irides deep-brown; bill and feet yellowish. Length, inclusive of tail, 50[illegible] inches; tail, 13$\frac{1}{4}$ inches.

Female.—She resembles the male in plumage, but is only 41$\frac{1}{4}$ inches, including the tail, which is 10$\frac{1}{4}$ inches.

The male is furnished with the gular pouch, like *Otis tarda*.

Egg.—Col. Sykes found only one in a hole in the earth on the open plain, and that considerably advanced in the process of incubation. In shape it was a perfect oval; and in colour a brown-olive, with obscure blotches of darker brown-olive. Length 3$\frac{4}{10}$ inches, diameter 2$\frac{7}{10}$ inches.

African Species.

Otis cærulescens. Description.—Summit of the head marked with black and reddish zig-zags, straight and nearly approximated. Above the eyes extends a large whitish band, punctured as it were with brown: plumes near the ear-opening of a clear ruddy colour. Under the neck a demi-circular band of pure white; and below, another twice as large, of deep black. Front of the neck, breast, and all the other lower parts of a lead-colour. All the upper parts of the body of a reddish or yellowish brown, marked with black zig-zags and dots very near together. Lower coverts of the wings and tail-feathers unspotted, ruddy. End of the tail black, tinged with brown. Quills black. Feet yellowish-green. Bill brown, yellow at the base. Length 20 inches; height, when erect, 17 inches 6 lines.

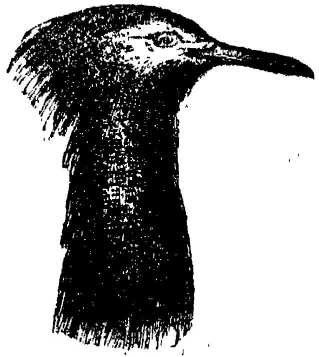
Le Vaillant discovered this species in the interior of South Africa, inhabiting the Caffre country, and some parts of the colony of the Cape of Good Hope. Temminck, from whom the description and figure are taken, says that he is ignorant whether the female differs in plumage from the male, of which latter sex were the two individuals he had seen. There are specimens in the Museums of Paris and of the Pays-Bas.

[Otis Cærulescens. Male.]

Though we have laid it down as a general rule not to carry our illustrations beyond one species of a section, the habits of one of the following bustards, and the unusual size of the other, must be our apology for shortly noticing them.

Otis Denhami, the African bustard met with by Major Denham near the larger towns, did not occur in any great abundance. It frequented moist places, where the herbage was pure and fresh, and where it was taken in snares by the natives for food. It was almost invariably seen singly, Major Denham never having observed a pair together more than once. It was always found in company with gazelles whenever a bustard was observed it was certain that the gazelles were not far distant. Major Denham praises its large and brilliant eye. The Arabs are accustomed to compare the eyes of their most beautiful women to those of the *Oubara*, which seems to be a general name for the bustards in Africa. Gmelin has given the title as a specific distinction to an African bustard smaller than Major Denham's, which is 3 feet 9 inches in length*. But this is small in comparison with the bustard (*Otis Kori*) discovered by Mr. Burchell in South Africa, for that stood upwards of 5 feet high, and may be considered the most gigantic development of the form hitherto observed.

Burchell, in his travels in the interior of Southern Africa, a book which, in addition to its other attractions, contains much valuable zoological information, communicated by an acute and accurate observer of nature, gives the following account of his becoming possessed of this noble bustard on the banks of the Gariep. 'We shot a large bird of the bustard kind, which was called *Wilde Paauw* (Wild Peacock). This name is here very wrongly applied, as the bird to which it properly belongs differs from this in every respect. There are indeed three, or perhaps four, birds to which, in different districts, this appellation is given. The present species, which is called *Kori* in the Sichuana language, measured, in extent of wing, not less than seven feet, and in bulk and weight was almost greater than some of the people could manage. The under part of the body was white, but the upper part was covered with fine lines of black on a light chestnut-coloured ground. The tail and quill feathers partook of the general colouring of the back the shoulders were marked with large blotches of black and white, and the top of the head was black; the feathers of the occiput were elongated into a crest; those of the neck were also elongated, loose, narrow, and pointed, and were of a whitish colour marked with numerous transverse lines of black. The irides were of a beautiful, pellucid, changeable, silvery, ferrugineous colour. A representation of the head of the *Kori Bustard* (here copied), is given at the end of the chapter. Its body was so thickly protected by feathers that our largest sized shot made no impression; and, taught by experience, the hunters never fire at it but with a bullet. It is reckoned the best of the winged game in the country, not only on account of its size, but because it is always found to abound in fat. The meat of it is not unlike that of a turkey, but is certainly superior, as possessing the flavour of game.'



[Head of Otis Kori.]

In the first part of the 3rd vol. of the 'Descriptive and illustrated Catalogue of the physiological series of comparative Anatomy,' contained in the museum of the Royal College of Surgeons, in London, a work in every way worthy of the grand collection which it describes, there is represented at plate 33, fig. 3, the head of a bustard (*Otis tarda*) with the auditory feathers or 'auriculars' spread out, so as to expose the external aperture and passage of the ear; the anterior feathers being shown as pressed forwards, and the posterior feathers in their place, the anterior surface of the external meatus and the membrana tympani are brought into view.

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* See *Travels* of Denham and Clapperton, *Appendix*, p. 119, 4to. edition.

BUTCHER-BIRD. [LANIADÆ.]

BUTE, JOHN STUART, third EARL OF, was the eldest son of John earl of Bute, in the Scottish peerage, and of Lady Anne Campbell, daughter of the first duke of Argyll. He was born in 1713, and received his education at Eton. He was introduced to public life in February, 1737, by being elected one of the sixteen Scottish representative peers. Such at least is the common account, which adds that he was sent up in the same character to every succeeding parliament till the year 1780. But in a sketch of his early life, quoted from a publication called 'The Contrast,' in the 'History of the Late Minority,' it is said, 'He was a man that at no time of life had opportunity or inclination of applying to business. When young he was disposed to gaiety; and though having been at the close of a session elected one of the sixteen peers, yet by his opposing, right or wrong, all measures of government, he was at the next election excluded, and then in disgust retired to an isle in the kingdom of Scotland, where he spent many years in close monasterial retirement.' If all this ever happened, it probably took place, not in 1737, but some years before, on his coming of age.

From 1737 he appears to have proceeded in a steady course of court favour. In that year he was appointed one of the Lords Commissioners of Police in Scotland, a Board which was suppressed in 1782. It was probably in this year also that he was introduced to the notice of Frederick Prince of Wales. Of the circumstances of this introduction 'The Contrast' gives the following curious account:—'The duchess of Queensberry having entertained her friends with the play of the Fair Penitent, the part of Lothario fell to the lot of his lordship, in which he succeeded so much better than in his late performances in the character of a statesman, that he was greatly admired, and particularly by his late Royal Highness Frederick Prince of Wales, who took great notice of this occasional Roscius, and invited him to Leicester House.' In August, 1738, he was made a Knight of the Thistle, and a few days after one of the Lords of the Bedchamber to the prince. On the death of Frederick in March, 1751, Lord Bute retired for some time to the country; but he is believed to have been consulted by the princess in regard to all points connected with the education of her son, afterwards George III. He was eventually appointed Groom of the Stole to that young prince. 'When it was proposed to settle the present king's household, as prince of Wales,' says Junius (note to Letter XXXV.), 'it is well known that the earl of Bute was forced into it in direct opposition to the late king's inclination. That was the salient point from which all the mischiefs and disgraces of the present reign took life and motion. From that moment Lord Bute never suffered the prince of Wales to be an instant out of his sight.' Mr. Adolphus, in his 'History of the Reign of George III.,' states that Blackstone at that time put the most interesting parts of his 'Commentaries' into the hands of Lord Bute, by whom they were laid before the prince. Various notices respecting Lord Bute, while holding office in the establishment of Leicester House, may be found in the 'Diary' of Bubb Dodington.

On the accession of George III. (October, 1760), Lord Bute, who had obtained a great ascendency over the mind of his pupil, was sworn a member of the privy council, and made Groom of the Stole. In March, 1761, he resigned that office, and was appointed one of the principal Secretaries of State. This elevation of the favourite to a place in the government was effected by the dismissal of Mr. Legge, the able chancellor of the exchequer, and by the concerted resignation of the earl of Holderness, into whose place Bute stepped, in consideration of a handsome pension, and the reversion of the wardenship of the Cinque Ports. Mr. Pitt however still continued for some time longer nominally at the head of the administration. On the 5th of October Mr. Pitt retired from the cabinet before the growing influence of the new secretary. Of the heads of the old Whig connexion, the duke of Newcastle, who was First Lord of the Treasury, still clung to office; but at length, on the 29th of May, 1762, he resigned, and Lord Bute was appointed his successor. On the 22nd of September following he was admitted a Knight of the Garter. On the 4th of April, 1761, his countess had been created a British peeress, by the title of Baroness Mountstuart, with remainder to her issue male by his lordship.

The history of the administration of Lord Bute belongs to the history of the country. It is written by the pen of a bitter opponent, in the first eleven chapters of the work entitled 'The History of the Minority,' the object of which is a defence of the politics of Lord Chatham and Earl Temple. Wilkes's weekly paper, the 'North Briton,' which began and ended with Lord Bute's administration, is also throughout occupied in the abuse of his lordship and everything connected with him. The 'North Briton' was set up in opposition to the 'Briton,' a paper established in the interest of the minister. One of the principal objects of Burke's celebrated 'Thoughts on the Cause of the Present Discontents' (published in 1780), is to expose what he describes as the new project or system of government contrived and attempted to be carried into effect by this minister. But he observes, 'This system has not arisen solely from the ambition of Lord Bute, but from the circumstances which favoured it. . . . We should have been tried with it if the earl of Bute had never existed; and it will want neither a contriving head nor active members, when the earl of Bute exists no longer.' Lord Bute occupies a large share of the latter part of Dodington's 'Diary,' which however only comes down to the 6th of February, 1761; but Mr. Adolphus, in the Appendix to the first volume of his History, has printed a series of 'Letters between Lord Bute and Lord Melcombe (Dodington) on the state of parties and politics, previous to and during Lord Bute's administration,' which he had obtained from Mr. Penruddocke Wyndham, the publisher of the 'Diary.'

Whatever were his merits or his demerits, Lord Bute was certainly the most unpopular English minister of modern times. While he madly attempted to govern the country by the king's name alone, he had opposed to him not only all the old factions of the state, which he aimed at putting down and destroying, but the whole nation. Forced by circumstances, therefore, as well as on principle, for he professed to hold the doctrine that the ministers were not really the executive government, but literally only the servants or clerks of the crown, he surrounded himself while in power by individuals in general utterly incapable of adding strength to his ministry by their abilities or personal importance. The late Lord Liverpool, indeed, then Mr. Jenkinson, was his private secretary; but his chancellor of the exchequer, for instance, was Sir Francis Dashwood, afterwards Lord Despenser, a person wholly incompetent.

The only important event in Lord Bute's administration was the termination of the war with France, by the peace of Paris, concluded February 10th, 1763. It was long a strong popular belief that the English minister was bribed by France to consent to this treaty; but no evidence worthy of credit was ever brought forward to confirm this rumour. On the 8th of April, 1763, Lord Bute suddenly resigned. His friends generally gave out at the time that he had taken office only with the purpose of bringing the war to an end, and that in now retiring he only followed a determination which he had from the first openly avowed. His own account however is somewhat different, as it is given in a letter to a friend, which has been published by Mr. Adolphus.—'Single,' he there says, 'in a cabinet of my own forming, no soul in the house of lords to support me except two peers (Lords Denbigh and Pomfret), both the secretaries of state silent, and the lord chief justice, whom I brought myself into office, voting for me, yet speaking against me—the ground I tread upon is so hollow, that I am afraid not only of falling myself, but of involving my royal master in my ruin: it is time for me to retire.' His lordship's own powers of oratory were not such as to make up for the silence of his colleagues. He expressed himself with a deliberate pomposity of utterance, his words slowly dropping out at regular intervals, which the witty Charles Townshend used to call the minister's minute guns.

Though Lord Bute retired from office he still retained the confidence of the king; and he undoubtedly nominated his immediate successors. In the following August, also, when the sudden death of the earl of Egremont, one of the secretaries of state, again shook the new cabinet, he engaged in a negotiation, which came to nothing, with the view of bringing Lord Chatham into office. Lord Bute's continued influence, as supposed to be exerted behind the throne, was long a favourite topic of popular declamation; but certainly no proof of the fact was ever brought forward. We have heard on good authority, that not long after he ceased to be minister, the king one day met him in the gardens at Kew, and turned his back upon him.

According to Sir Egerton Brydges, in his edition of Collins's 'Peerage,' Lord Bute 'passed the last six or seven years of his life in the most deep and unbroken retirement, principally at a marine villa, which he built on the edge of the cliff at Christchurch, in Hampshire, overlooking the Needles and the Isle of Wight. Here his principal delight was to listen to the melancholy roar of the sea.' 'He was more fond of the sciences,' it is added, 'than of works of imagination; but his favourite study was botany, on which he printed at his own expense a work in nine volumes quarto, of plates appertaining only to England. Only twelve copies were printed, of which the expense amounted to 10,000*l*.' Lord Bute had the merit of being a liberal patron of men of genius, both in literature and the arts. Among others, Dr. Johnson, and Home, the author of the tragedy of 'Douglas,' were indebted to him, the one for a pension, the other for a place. The architects George and Robert Adams, and Joshua Kirby, were all employed and munificently encouraged by him. The first part of Kirby's 'Perspective of Architecture' (published in 1761) contains 'the description and use of a new instrument, called the Architectonic Sextor,' which is stated to have been invented by the Earl of Bute. He employed Robert Adams to build a splendid mansion for him at Luton Hoo, near St. Alban's, where he amassed a valuable library, and one of the richest collections of paintings, especially of the Dutch and Flemish schools, in the kingdom. (See a description of the library and gallery in the *Gentleman's Magazine* for 1817, Part 2nd.) He died at his house in South Audley-street, London, on the 10th of March, 1792. He had married in 1736, Mary, the only daughter of Edward Wortley Montagu, of Wortley, in Yorkshire: and by that lady, who eventually inherited a large fortune by the death of her brother, Edward W. Montagu, the traveller, he had seven sons and six daughters. His eldest son was, in 1796, created Marquess of Bute, in the British peerage.

BUTEA. [PTEROCARPUS.]

BUTESHIRE consists of the islands of Bute, Arran, Inchmarnock, and the Cumbraes, in the Frith of Clyde, on the W. coast of Scotland. [ARRAN.]

The island of Bute is about 6 miles from Ayrshire, and half a mile from Cowal in Argyleshire. It is about 18 miles long and 4 or 5 in breadth. To the N. it is elevated, rocky, and barren; the central part is diversified by hills, valleys, and fertile tracts; and the S. end is hilly and divided from the rest of the island by a low and sandy plain called Langal-chorid. From Kilchattan Hill, in the S. district, there is an extensive prospect. The coast is rocky and indented by bays; the soil consists of clay, loam, and sand, with moss lying on gravel. The greater part of the arable land is inclosed and cultivated; barley, oats and potatoes are raised: turnips and artificial grasses have been introduced with success.

The minerals are limestone, freestone, slate, and some indifferent coal. Beds of coral and shells of considerable thickness are found in many places half a mile from the sea-coast. Rothesay, a small royal burgh on the N.E. coast at the bottom of an extensive bay, was formerly frequented by herring-boats, and it is now a favourite watering-place. The castle, which was sometimes inhabited by the kings of Scotland, and afterwards by the Bute family, was burnt in 1685 by the Marquis of Argyle, and is now in ruins. In former times there were 10 or 12 churches and 30 hermitages in this island. In the S. part of the island there is a place called the Devil's Cauldron, which is formed of stone without cement; the walls are now only a few feet in height and 10 in breadth; the area 30 feet in diameter: the object of the erection is unknown.

Inchmarnock, an island on the W. coast of Bute, about a mile in length, contains 120 acres of arable land and 340 of moor and pasture. Its minerals and agricultural products are the same as Bute: it was a seat of the Culdees.

The Cumbraes are two islands opposite the E. coast of Bute, and separated from Amringham, in Ayrshire, by a narrow channel called Fairly Road. Little Cumbrae is a mile long and half a mile broad. A lighthouse was erected on the highest part of the island in 1750. Great Cumbrae, two miles from Ayrshire and three from Bute, is separated from Little Cumbrae by a channel three-quarters of a mile broad. It is about 2½ miles long and 1½ broad. The surface contains 2300 acres, a few of which are under cultivation. The village of Milnport has a convenient harbour, and is frequented as a watering-place. On the E. coast two rocks called Rippel Walls, distant from each other 500 feet, and stretching in parallel lines across a plain, are composed of the same materials as the basaltic rocks at Staffa, but are not columnar.

By the Scotch Reform Act the burgh of Rothesay was made part of the county of Bute, which sends one member to parliament.

The population of Buteshire, in 1831, was 14,151. The island of Little Cumbrae was inhabited in 1831 by three families, those of a grazier or rabbit-catcher, a fisherman, and a lighthouse keeper, making in all 17 persons. More than 200 males, upwards of twenty years of age, are employed as weavers in the county of Bute: of these 90 are in the parish of Rothesay, 66 in Great Cumbrae, and 46 at Kilmory weave cotton goods in a wholesale manner, the intercourse of that place with Glasgow by steam-boats being cheap and rapid. Since 1821 the population of the parishes of Kilbride and Kilmory have respectively diminished 58 and 56 persons, owing to emigration to America. The enlargement of farms and removal of cotters has decreased the population of the parish of Rothesay 333 persons, while the influx of strangers has added to the burgh 710 persons.

From the returns from sheriffs in 1826, it appears that the number of schools in Buteshire was then two schools in the parish of Cumbrae, a parish-school containing eighty scholars, and a private one containing thirty-five; the private schoolmaster was supported by fees of 2*s.* 6*d.* per quarter for reading, and 3*s.* for writing, and by working at the looms during vacant hours. The parish schoolmaster was supported by school-fees, and a salary which amounted for the year ending 1835 to 30*l.* Gaelic and English have both been taught from time immemorial in the parish of Kilmory. It has five schools, attended by about forty pupils each; the teachers of each of which receive a portion of the salary. Besides these there are seven private; they are taught only during the summer and winter quarters, and their average attendance is about thirty-five. There are three teachers who have salaries on a legal provision in the parish of Kilbride; and besides these there are two other schools, to one of which there is a small salary attached. By the Scotch Reform Bill the borough of Rothesay was made part of the county of Bute.

BUTLER, CHARLES, was born in London of a Roman Catholic family in 1750. He was the son of Mr. James Butler, who was the youngest son of Simon Butler of Appletree, Northamptonshire: his mother's name was Grano. After receiving the rudiments of education at a Roman Catholic school at Hammersmith, he was sent to the English college at Douay, where, according to his own account, the scholars were excellently instructed in their religion, and the classics were well taught; 'but writing, arithmetic, and geography were little thought of, modern history was scarcely mentioned, and but small regard was paid to manners.' The discipline was somewhat ascetic, and its object was far more to qualify those trained under it to become obedient members of a particular church, than to be useful and active citizens of general society.

From Douay Mr. Butler removed to Lincoln's Inn, where he entered on the study of the law, and ultimately practised as a conveyancer: the remainder of his life may be comprised in the history of his numerous publications. He first appeared before the public anonymously, in an essay published in 1773, 'On Houses of Industry,' written at the request of Sir Harbord Harbord, afterwards Lord Suffield, and of a Mr. Chad, afterwards created a baronet. It chiefly related to the county of Norfolk, beyond which, as its author very modestly says of it, it obtained very little circulation. Five years afterwards he wrote a more important pamphlet 'On the Legality of Impressing Seamen.' It was favourably received, and procured for him the acquaintance of Lord Sandwich, at that time first lord of the admiralty, who wrote a few pages in the second edition, and of Wedderburne, then solicitor-general, and afterwards Lord Loughborough. The chief arguments and authorities were taken from the speech of Sir Michael Forster, in the case of Alexander Broadfoot, who was indicted for the murder of a sailor, being one of a party that endeavoured to impress him. So little original matter is added in the pamphlet to the arguments of Sir M. Forster, that Mr. Butler afterwards refused to admit it into the general collection of his works. In the following year Mr. Butler prepared a speech, which Lord Sandwich delivered in the House of Lords, in defence of his government of Greenwich Hospital; and about the same time, in conjunction with Mr. Wilkes, he appeared as an inquirer into the authorship of Junius. A letter, including the results of their conversations, was printed without Mr. Butler's knowledge in the 'Anti-Jacobin Review,' and it is reprinted in his 'Reminiscences.' It rather disputes the claims of all the candidates who have been brought forward from time to time, than affirms the pretensions of any one of them. In the additional remarks made on the reprint in the 'Reminiscences,' Mr. Butler seems inclined to believe that Junius himself has never been detected: that he was of too high a rank to be bought, and that Sir Philip Francis was his amanuensis. Mr. Butler next engaged himself in the professional task of continuing and completing Mr. Hargrave's edition of 'Coke upon Littleton.' Eleven years had been employed by the first editor on half of the work. Four terms was the short period allotted to Mr. Butler for the execution of the remainder. The value of the original is well known to lawyers, but it perhaps is scarcely so well appreciated without the bar as it deserves to be. The following testimony may be little expected:—'It is very remarkable,' says Mr. Butler, 'that some English gentlemen, nowise connected with the profession of the law, beguiled their tedious exile at Verdun with a serious perusal of Coke upon Littleton, and have often spoken of the great mental delight which it afforded them.' Numerous editions of Coke upon Littleton followed at intervals during the life of Mr. Butler. To this work succeeded 'Horæ Juridicæ subsecivæ, being a connected series of notes respecting the geography, chronology, and literary history of the principal codes and original documents of the Grecian, Roman, feudal, and canon law;' an outline of very great use to the historian as well as to the lawyer. Mr. Butler also superintended a new edition of Fearne's 'Essay on Contingent Remainders,' and he contributed to Mr. Seaward's 'Anecdotes' an 'Essay on the Character of Lord Mansfield's Forensic Eloquence.' The 'Horæ Biblicæ' comes next, and is perhaps the most popular of all Mr. Butler's works. It had long engaged his thoughts, and a private edition of the first part had been printed before its completion in 1797. The first part professes to contain an historical and literary account of the original text, early versions, and printed editions of the Old and New Testaments; the second to embrace a similar account of the Koran, the Zend-Avasta, the Kings, and the Edda. It is free from party theological spirit, and it speedily ran through five editions. In 1806 the great change in the constitution of the Austrian dominions induced Mr. Butler to draw up, chiefly from Anderson and Koch, a succinct history of the geographical and political revolutions of the German empire; and his pen, for the remainder of his life, was largely employed on subjects regarding his own church, which are collected in his general works. Among them are several biographies, drawn up with spirit and accuracy; lives of Bossuet, of Fenelon, of Abbé de Rancé, abbot of La Trappe, of St. Vincent of Paul, of Erasmus, of Grotius, of Henri Marie de Boudon, of Thomas à Kempis, of the Chancellor L'Hôpital, &c., and of his own uncle the Rev. Alban Butler, author of 'Lives of the Saints,' a work which Mr. Butler himself continued. The relief proposed to be given to the Roman Catholics in 1795 occasioned three books, written in conjunction with Joseph Wilkes, a Benedictine, and named, from the colour of their covering, the 'Blue Books.' It is needless to say that Mr. Butler was a strenuous advocate of Roman Catholic emancipation, and that much of the successful progress of that measure is to be attributed to the 'Historical Memoirs of the English, Irish, and Scottish Catholics,' 1819. Hitherto he had abstained from controversy, but the appearance of Dr. Southey's 'Book of the Church' engaged him in a series of letters to that writer, and afterwards in two replies to the present bishop of London, and to the Rev. George Townsend. They were written in a spirit of gentleness very seldom found in similar publications. The first volume of his 'Reminiscences,' chiefly containing the history of his literary life, was published in 1822, the second in 1827. They contain some very interesting details, but are expressed in the cramped style of most autobiographies. As a conveyancer Mr. Butler had full practice, and he was the first of his communion who was called to the bar after the Relief Act in 1791. He was afterwards made king's counsel. He married in early life, and left two daughters, one of whom married Andrew H. Lynch, Esq., of the Chancery bar, and the other Lieut. Col. Stonor. Mr. Butler died at his own house in Great Ormond Street, London, leaving behind him an unblemished character and a considerable literary reputation, June 2, 1832. (*Obituary* in the 'Gentleman's Magazine,' Sept. 1832; *Reminiscences*.)

BUTLER, JAMES. [ORMOND, DUKE OF.]

BUTLER, JOSEPH, born at Wantage in Berkshire in 1692, was the son of Thomas Butler, a respectable shopkeeper, and a dissenter of the Presbyterian denomination. He received the rudiments of his education in the free grammar-school at Wantage, whence he was removed to the Dissenting Academy of Tewkesbury in Gloucestershire, then superintended by Mr. Jones, who had the singular fortune of having for pupils, with the view of being ordained to the Presbyterian ministry, three young men, afterwards prelates of the Established Church—Chandler, Butler, and Secker; the two latter were contemporaries. It was here that Butler gave the first proofs of the peculiar bent of his mind to abstruse speculation. Being dissatisfied with the argument *à priori* of Dr. Samuel Clarke in his 'Demonstration of the Being and Attributes of God,' he ventured, being then only in his twenty-second year, to express by a letter his doubts, and to offer his objections, to that acute writer. Dr. Clarke was for a time unacquainted with the name of his correspondent. The manner in which he replied to Butler's objections, and the fact of his publishing the letters in which they were conveyed, with his own answers, in subsequent editions of his work, sufficiently show that he felt the remarks of his youthful correspondent to be not without their weight.

About this time Butler was led to a more particular examination of the tenets of the religious body to which he belonged, the result of which, after some natural opposition from his father, accompanied with remonstrances from several respectable Presbyterian divines, was a secession from Presbyterianism, and a conformity to the Church of England. His views being thus changed, he entered Oriel College, Oxford, in March, 1714, and soon after was admitted into holy orders. While at Oriel he formed a friendship with Mr. Edward Talbot, the second son of Dr. Talbot, bishop of Durham, a circumstance to which he appears to have owed his subsequent promotion. In 1718 he was recommended by Mr. Talbot and Dr. Clarke to Sir Joseph Jekyll, Master of the Rolls, by whom he was appointed preacher at the Rolls. In 1721, on being presented by Bishop Talbot to the rectory of Haughton, near Darlington, he divided his residence between the Rolls and his parochial benefice. In 1725 he received Stanhope, one of the wealthiest but most retired rectories in England, from the same patron, in exchange for Haughton. In 1726 he resigned the Rolls preachership, and went to reside upon his rectory of Stanhope. In the same year he published a volume of fifteen sermons preached at the Rolls. These sermons are, upon his own acknowledgment, of a somewhat abstruse character, which arises as much from the method as from the scope of his argument, which is to demonstrate vice to be 'a violation or breaking in upon our nature.' He wished to show that man was formed for virtue, and that vice is a departure from his intended condition; to prove that religion and virtue were primarily natural to man; that they constitute order, whereas their opposite is disorder. Although his object might have been effected by the more direct proof that 'vice is contrary to the nature and reason of things,' he chose the other method, as 'in a peculiar manner adapted to satisfy a fair mind, and as more easily applicable to the several particular relations and circumstances in life.' The first three sermons are entitled, 'Upon Human Nature; or, Man considered as a Moral Agent.' That man is made for society, is evident from all we know of him; the very parts of his body show dependence one on another; and it is no wresting of words or of argument to carry the comparison further, and to show that mankind in general is a body made up of a number and variety of members, like the natural body. As it is the office of his own several component parts, or members, each to assist and benefit the others, so it is the duty of each member of society to promote the general welfare; and any deviations from this rule, which is in fact a rule of nature, have been the deviations of ignorance and sin. The author establishes his point by three proofs. First, there is in man a natural principle of benevolence, which is, in its degree to society, what self-love is to the individual; and, that there is such a principle, appears from the existence and operation of those feelings, which are called affections. Are we not inclined to love, to friendship, to compassion? That we are thus inclined in *any* degree is enough for the purpose. It matters not how narrow and obscure these feelings are. If they exist at all, they 'prove the assertion, and point out what we were designed for.' Secondly, there are several affections or passions distinct both from benevolence and self-love, which in general contribute and lead us to public good as really as to private. Thirdly, there is a principle of reflection, by which men approve or disapprove of their own actions; this is conscience, which faculty tends to restrain men from doing mischief to one another, and leads them to do good. That man has evil dispositions is no objection to this mode of argument, for his ungoverned passions incline him to act against his own interests, as well as against the interests of others. The pure nature of man then would lead him to right conduct in society, or what we denominate virtue. To understand the purpose of a being, we must ascertain the bent of his *true* nature: and, where the true nature is known, there can be no difficulty. The illustration used is that of the eye. The eye is designed for vision; and, as we are not to judge of first design from any state of defect into which it may have casually fallen, neither are we to judge of the true nature of man from any present perversion of inclination; and the objection to his argument, 'that nature is that to which any man is most inclined, and that the following of nature is but a following of inclination, which may be different in different individuals,' is answered by an explanation of the term. 'By nature,' he says, 'is often meant no more than some principle in man, without regard either to the kind or degree of it.' This however is manifestly wrong; for the same person may have contrary principles, driving or urging him contrary ways. Again, 'Nature is frequently spoken of as consisting in those passions which are strongest, and most influence the actions.' This is wrong too. Men are certainly *now* vicious, as it were, by nature; but they are so because their nature is deteriorated, and the argument refers to the original and pure nature. In neither of these senses is man's primary nature to be received, because, to follow nature in either of them, would be a wandering from the original design, and a following of what had become faulty. The text of the second sermon shows the meaning in which the word nature ought to be used. 'For when the Gentiles which have not the law, do by nature the things contained in the law, these having not the law are a law unto themselves. Which show the works of the law written in their hearts, their consciences also bearing witness, and their thoughts the meanwhile accusing or else excusing one another.' Conscience makes man a moral agent. It justifies and it condemns. It cannot justify what is wrong; it cannot condemn what is right; right, therefore, is natural to man, and determined by the testimony of conscience alone. After establishing the supremacy of conscience, he forms his notion of human nature, in the following of which virtue is said to consist, and the deviation from which is vice. 'As the idea of a civil constitution implies in it united strength, various subordinations, under one direction, that of the supreme authority, the different strength of each particular member of the society not coming into the idea; whereas, if you leave out the subordination, the union, and the one direction, you destroy and lose it: so reason, several appetites, passions, and affections prevailing in different degrees of strength, is not *that* idea or notion of *human nature;* but *that nature* consists in these several principles considered as having a natural respect to each other, in the several passions being naturally subordinate to the one superior principle of reflection or conscience. Every bias, instinct, propension within, is a real part of our nature, but not the whole. Add to these the superior faculty, whose office it is to adjust, manage, and preside over them, and take in this its natural superiority, and you complete the idea of human nature.' A deviation from it, or its violation, he thus defines: 'And as in civil government the constitution is broken in upon and violated by power and strength prevailing over authority, so the constitution of man is broken in upon and violated by the lower faculties or principles within prevailing over that which is in its nature supreme over them all. Man indeed cannot be considered as left to himself, to act as present inclination may lead him: the very ability of putting the question, 'Is this I am going about right, or is it wrong? Is it [illegible], or is it evil?' implies an obligation to act rightly, for it shows that he has a natural conception of right. The objection, 'Why should we be concerned about anything out of and beyond ourselves?' is thus removed. Are we, or can we be, indifferent to disgrace, neglect, or contempt? Man is by nature disposed to action; and 'upon comparing some actions with this nature, they appear suitable and correspondent to it: from comparison of other actions with the same nature, there arises to our view some unsuitableness or disproportion.' Those which are most suitable to it are the law or design of nature; and that which promotes real happiness, or the true purpose of nature, is virtue.

These sermons contain the germ of those principles of analogy which were afterwards developed by the author in a separate work; when viewed in all their parts and bearings, they must be considered as one of the most successful attempts to explain the true nature of man as a moral agent, and to discover the springs of human action. It has been observed by a recent writer (Austin, *The Province of Jurisprudence determined*, p. 109), 'In so far as I can gather his opinion from his admirable sermons, it would seem that the compound hypothesis (that is, the hypothesis compounded of the hypothesis of utility, and the hypothesis of the moral sense) was embraced by Bishop Butler. But of this I am not certain: for, from many passages in those sermons, we may infer that he thought the moral sense our only index and guide.' In this remark we concur: in several passages Butler seems to consider the moral sense as that by which we judge of the character of actions, and yet there are other passages which appear to prevent us from adopting this conclusion.

It is unnecessary to analyse the other admirable discourses: that on the government of the tongue is a masterpiece of its kind; and the sermons on resentment and forgiveness of injuries are equally remarkable for the profound insight into the principles by which human society is held together, and for their practical utility.

To this volume, in a later edition, he appended six other sermons, preached on certain public occasions. One of these sermons (the fourth) is well calculated to meet certain objections that have been made to the education of the poor.

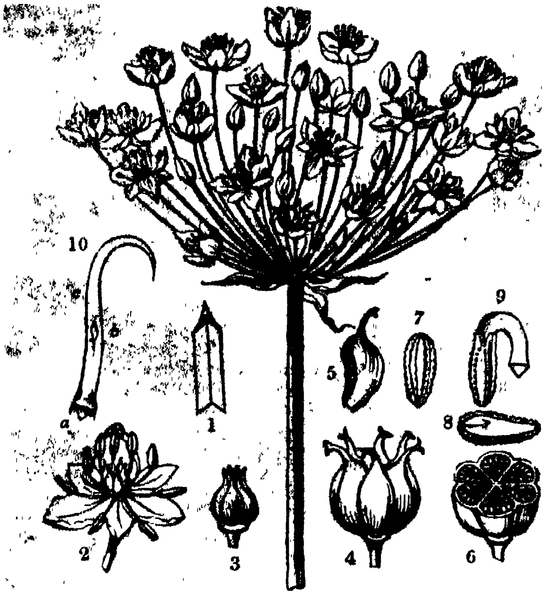
His residence at Stanhope continued until 1733, when he was drawn from his retirement by being appointed chaplain to Lord Chancellor Talbot. About the same time he was presented by his patron to a prebend in the church of Rochester. This was done through the interposition of his friend and fellow-pupil Secker, who was anxious for his re-appearance in the world, and wished to see him in some more conspicuous station than the rectory of Stanhope. Secker, having taken occasion to mention him to Queen Caroline, her Majesty remarked that she thought he was dead; and, not satisfied with his assurance to the contrary, she inquired of Archbishop Blackburne, who replied, 'No, madam, but he is buried.' In 1736 Butler was appointed clerk of the closet to the queen, upon whom he was in constant attendance until her death in the following year. So highly indeed did she esteem him that she required his presence two hours every evening. He had lately produced his great work, 'The Analogy of Religion, Natural and Revealed, to the constitution and course of Nature,' which he had presented to her Majesty before publication, and which he dedicated to the Lord Chancellor Talbot, 'in acknowledgment of the highest obligations to the late Lord Bishop of Durham, and to himself.' In this work it was his aim to demonstrate the connexion between the present and a future state, and to show that there could be but one author of both, and consequently one general system of moral government by which they must be regulated. Of this admirable work it has been justly observed, 'Upon the whole, as our author was the first who handled the argument in proof of religion from analogy in a set treatise, he has undeniably merited the character of a first discoverer; others indeed had occasionally dropped some hints and remarks of the argument, but Dr. Butler first brought it to a state of perfection. The treatise contains the finishing and completion of that way of reasoning, the foundation whereof was laid in his sermons.' The year after the death of Queen Caroline he was made bishop of Bristol; and in 1740 he was presented to the deanery of St. Paul's, on which occasion he resigned the rectory of Stanhope. One of his first acts of patronage was to bestow on his old master, Mr. Barton, master of the school at Wantage, the rectory of Hutton in Essex. Butler was always liberal in the expenditure of his money; he laid out on the episcopal palace of Bristol 4000*l*., and he was a munificent benefactor to charitable institutions. In 1746 he was appointed clerk of the closet to the king; and in 1750 was translated to the see of Durham, vacant by the death of Dr. Edward Chandler, who had also been a pupil, as already mentioned, at the academy at Tewkesbury. The short time that he held this see allowed him to make only one visitation of his diocese. The charge which he delivered to his clergy on that occasion subjected him to much animadversion. He had begun by lamenting the general decay of religion, and noticed it 'as a complaint by all serious persons.' As an aid in remedying this evil he recommended his clergy to 'keep as well as they were able the form and face of religion with decency and reverence, and in such a degree as to bring the thoughts of religion often to the minds of the people; and to endeavour to make this form more and more subservient to promote the reality and power of it.' He insisted that although the form might and often did exist without the substance, yet that the substance could not be preserved among mankind without the form. He instanced the examples of heathen, Mohammedan, and Roman Catholic countries, where the form had been very influential in causing the superstition to sink deeply into the mind; and he inferred that true religion would, by the same rule, sink the more deeply with such aid into the minds of all who should be serious and well disposed. These observations, which, like all the remarks of this profound thinker, show an intimate acquaintance with human nature, were strongly censured as savouring of popery, and he was particularly attacked in a pamphlet entitled 'A Serious Inquiry into the use and importance of External Religion, occasioned by some passages in the Right Reverend the Lord Bishop of Durham's Charge to the Clergy of that Diocese.' The very sentence in which he says that the form is to be made 'subservient to promote the reality and the power,' ought to have been sufficient to protect him. Bishop Butler did not long enjoy his last preferment. His health rapidly declined, and he died at Bath on the 16th of June, 1752, and was buried in Bristol cathedral. His writings, though not numerous, are sufficient to show the extent of his knowledge, the solidity of his judgment, and the great powers of his mind. His statement of a question is fair and candid, his reasoning is close and sincere, and his conclusions nearly always just and convincing. His piety was unostentatious but fervent, with something from natural disposition and the grave direction of his studies approaching to gloom. A man whose thoughts were so seriously employed, whose inquiries were of so abstruse a character, could hardly be otherwise. Still 'no man ever more thoroughly possessed that *meekness of wisdom* which the apostle enjoins; he had noticed the expression for its beauty; his heart and disposition were conformed to it, and in high as in humble life it was uniformly manifested in his conversation. Neither the consciousness of intellectual strength, nor the just reputation which he had thereby attained, nor the elevated station to which he had been raised, in the slightest degree injured the natural modesty of his character, or the mildness and sweetness of his temper.' His intercourse with clergy and laity was open and free; his income he considered to belong to his station, and not to himself; and so thoroughly was this feeling of his understood that his relatives never indulged the expectation of pecuniary benefit from his death. It was his remark, on his promotion to Durham, 'It would be a melancholy thing in the close of life to have no reflections to entertain oneself with, that one had spent the revenues of the bishopric of Durham in a sumptuous course of living, and enriched one's friends with the promotions of it, instead of really having set oneself to do good, and to promote worthy men.' It has already been stated that he was accused of a disposition to popery, in consequence of some expressions in his charge to the clergy of Durham. This charge was repeated by an anonymous writer fifteen years after his death, and was made to rest chiefly on the circumstance of his having put up a cross in the episcopal chapel of Bristol. It was also asserted that he had died in communion with the church of Rome. His friend Secker, at that time archbishop of Canterbury, satisfactorily disproved the charge. He did not deny that the bishop had erected the cross, but this, he contended, was no manifestation of popery; it was merely as an emblem and a memorial of the Christian faith. With respect to his having died in communion with the church of Rome, the circumstance was not even hinted at until fifteen years after his death; and it is clearly shown, by the testimony of those who attended him in his last illness, that there is no truth in the statement. Bishop Butler was never married. His works are collected in two volumes 8vo., which have been several times reprinted.

BUTLER, SAMUEL, was born at Strensham, in Worcestershire, about 1612, and educated in the Free School at Worcester. The finances of his father, who was a small farmer, would not allow him to be matriculated at Cambridge, to which university he desired and his proficiency in learning entitled him to proceed. Accordingly he engaged as clerk to Mr. Jeffereys, an eminent justice of the peace, of Carlscroom, in his native county. Here in his leisure hours he employed himself in studying history, poetry, music, and painting; some specimens of his skill in the last-named art existed not long since, and it is said were not worth preserving. We know not how he afterwards obtained an introduction to Elizabeth Countess of Kent, but under her patronage he had access to a well-stocked library, and enjoyed the conversation of the learned Selden. He entered afterwards into the service of Sir Samuel Luke, a knight of antient family in Bedfordshire, who had been one of Cromwell's commanders, and is supposed to have been the prototype of the character of Hudibras. After the Restoration he became secretary to Richard Earl of Carbury, Lord President of the Principality of Wales, who, on the revival of the court of the Marches, made him steward of Ludlow Castle, soon after which he married Mrs. Herbert, a gentlewoman of good family, whose fortune was lost to him by being invested in bad securities. It is also said that he was secretary to the second George Villiers, Duke of Buckingham, when he was chancellor of Cambridge. With that nobleman, with the Earl of Dorset, and with many other wits of the time, he certainly lived on terms of familiar intercourse; yet he died, as is believed, in great poverty in 1680, and was buried in the churchyard of St. Paul's, Covent Garden, at the expense of his friend Mr. William Longueville, a bencher of the Inner Temple, who, according to common report, rescued him from absolute starvation, and after his death became possessed of his papers.

The first part of Hudibras, containing three cantos, was published in 1663, and soon became eminently popular, and was much quoted even at court. In the next year appeared the second part. The third part, which does not bring the poem to a conclusion, was not published till 1678. Three small volumes of posthumous works were published, as Johnson says, 'I know not by whom collected or by what authority ascertained.' Two more, undoubtedly genuine, were afterwards printed by Mr. Thyer of Manchester. Some of his posthumous poems are very obscene.

Such is the scanty record of perhaps the most witty writer in our language. 'The events of his life,' says his biographer whom we have already cited, 'are variously stated, and all that can be told with certainty is that he was poor. On a work so well known as Butler's Hudibras it is scarcely necessary to make a single remark. Voltaire has well said of it that it unites the wit of Don Quixote with that of the Satyre Menippee. Hudibras, the hero, is a Presbyterian justice, who, fired with the same species of madness as the Don Quixote of Cervantes, undertakes the reform of abuses, in company with his Squire Ralph, an Independent clerk, with whom he is almost always engaged in controversy. This union of the knight errant and the Presbyterian is faulty in the outset, and in the *conduct* of the poem there is little to satisfy the reader. The adventures are tiresome and tedious, but the dialogues are carried on with a strain of wit which appears to be exhaustless. The characters which were before the eyes of our forefathers have passed away, but so great was Butler's knowl[illegible] human nature, that many of his distichs have [illegible] proverbial. However easy may appear the style [illegible]que which he has adopted, and however frequently [illegible]lar course has been followed after him, it is not among the lea[illegible]t proofs of Butler's extraordinary excellence that he is [illegible]thout a rival among his imitators. The standard edition was published in 1744 in two vols. 8vo., with laboriously illustrative notes by Dr. Grey. In 1721 John Barber, citizen and one time Lord Mayor of London, erected a cenotaph in Westminster Abbey to Butler's memory, which provoked a just epigram from Samuel Wesley, and a sarcasm, which appears to have been little merited, from Pope.

BUTOMA'CEÆ, a natural order of Endogens, the type of which is the *Butomus umbellatus*, a common water-plant of this country. It is vulgarly called the Flowering Rush, and is accounted the handsomest herbaceous plant of the British Flora. Butomaceæ are briefly characterised by being tripetaloideous endogens (that is, with three sepals distinct in size and colour from the three petals) with several carpels, the whole lining of which is covered with seeds. This simple circumstance cuts them off from Alismaceæ, with which they were once associated, and also distinguishes them from all other monocotyledonous orders. The order is a very small one, not containing more than three known genera, and about half a dozen species, natives of equinoctial America, exclusive of the *Butomus umbellatus* of England and another species of the same genus occurring in Nepal.



[Butomus umbellatus.]

1, a section of a portion of a leaf; 2, an entire flower; 3, the carpels; 4, the ripe fruit; 5, a separate carpel; 6, a transverse section, showing how the whole lining of the ripe carpels is covered with seeds; 7, a seed much magnified; 8, a longitudinal section of the same; 9, a seed germinating; 10, the same in a more advanced state; c, is the cotyledon; *b*, the plumule sprouting; a, the radicle just bursting through its integuments. (N.B. This offers an illustration of the endorhizal mode of germination.)

Butomus umbellatus is a rush-like plant with three-cornered sword-shaped leaves, and umbels of handsome rose-coloured flowers, containing *nine* stamens, a peculiarity by which it is immediately recognised among other wild flowers. The roots of it are regarded in Russia as a specific in hydrophobia; but experiments made with them in this country have not confirmed the accounts of their influence in this utterly incurable disease recorded by the Russian physicians.

BUTOOL, a small district of the province of Oude on the E. frontier adjoining to Gorkha, in which country the village of Butool, from which the district derives its name, is in fact situated. This village stands at the foot of a range of hills on the right bank of the river Tenavy, in 27° 37′ N. lat. and 83° [illegible]′ E. long., and rather more than 60 miles N. from [illegible] of Goruckpore. It was clearly established by the G[illegible] in the discussions which led to the treaty with the [illegible] of 1816, that the village of Butool had never rightly formed part of the dominions of Oude, and its possession was in consequence assured to them by the British. The village is extremely unhealthy, and on this account is nearly deserted during the rainy seasons. The lands which form the present district of Butool, and which were proved to have belonged to the nabob of Oude, are consequently now a[illegible]itish possessions: their annual value was stated in [illegible] at 40,000 rupees.

BUTRINTO, Buthrótum, an antient town, now ruined, on the coast of Epirus, on the northern or narrow part of the channel which divides the island of Corfu from the mainland. It stood on a hill surrounded by marshy ground, and forming a sort of peninsula at the entrance of the harbour Pelodes, and nearly opposite the promontory of Leucimne in the island of Corfu. (Strabo, vii.) Virgil calls it 'lofty Buthrotum' (*Æneid*, iii.), where he makes Æneas meet Helenus the son of Priam, who ruled over the country of the Chaonians after the death of Pyrrhus the son of Achilles. (Justin, xvii.) After the conquest of Epirus by the Romans, Buthrotum became a Roman colony. Pomponius Atticus had an estate near Buthrotum, where he spent great part of his time; and both he and Cicero interested themselves in favour of the Buthrotians, whose lands had been confiscated and given away to fresh colonists during the civil war. Atticus wrote to Cæsar on the subject, and he paid out of his own pocket part of the fine due by the Buthrotians, upon which Cæsar reversed the sentence. After the death of Cæsar the affairs of the Buthrotians was still in agitation, and we find Cicero writing to the Prætor Plancus and others in their favour. (*Epist. ad Attic.* xvi. 16.) Under the Byzantine empire, Buthrotum was a bishop's see suffragan to the archbishop of Lepanto. It was afterwards ruined, probably at the Turkish invasion. The Venetians, in their wars with the Turks, settled on this coast, and built a square fort at the foot of the hill on the sea-side, where they kept a garrison to protect their fisheries. Butrinto and Parga were dependencies of the Venetian government of Corfu. The Venetian writers of the last century speak of the antient town of Buthrotum as completely ruined, and they mention statues, pillars, medals, and cameos as found in digging the ground. They represent the country as marshy and unwholesome, and almost desert, and abounding with game. The little river Paula, issuing out of the marshes of Butrintò, empties itself into the sea. (*Topografia Veneta*; Coronelli, *Atlante Veneto.*) In 1797, after the fall of the Venetian republic, the French put a garrison in the fort of Butrintò, but in the following year Ali Pasha drove them from that as well as from the other Venetian strongholds on the coast of Albania, which were re-united to the Turkish dominion.

BUTTER. The preparation of butter is an important part of rural economy. When salted it is extensively used as provision for domestic use and in the victualling of ships, and is a considerable article of commerce. Butter is the fat or oleaginous part of the milk of various animals, principally of the domestic cow. The milk of the cow is composed of three distinct ingredients, the curd, the whey, and the butter; the two first form the largest portion, and the last the most valuable. The comparative value of the milk of different cows, or of the same cows fed on different pastures, is estimated chiefly by the quantity of butter contained in it; and in this respect some breeds of cows are far superior to others. The union of the component parts of milk is chiefly mechanical, as they separate by subsidence according to their specific gravities, the cream being the lightest, and the curd the heaviest; the curd however requires a slight chemical change for its separation from the whey, which at the same time produces a peculiar acid called the lactic acid. From the moment that milk is drawn from the cow it begins to be affected by the air and changes of temperature, and circumstances almost imperceptible to our senses will, materially affect its quality. Hence the importance of extreme care and attention in every step of the process of the dairy, especially in making butter.

The cows should be milked in the cool of the morning and evening; they should not be much driven immediately before milking, and it is best to bring them to the place of milking some time before the operation begins. In some situations it is better to milk them in the pastures and carry the milk home; in others to drive the cows gently to the cow-stall. In mountainous countries the first mode is generally adopted, because the cows are apt to leap down steep places, and shake the milk in their udder more than is done by carrying it in the pail. The same practice holds good in Holland from another cause, which is, the distance of the pastures from the home-stall, and the facility of transporting the milk in small boats, all the best pastures being surrounded by small canals communicating with the greater; so that the milk may be carried several miles without the least agitation. In England, where the pastures frequently surround the habitation of the dairyman, the cows are generally driven home twice a day to be milked. As the slightest acidity or putrescence immediately causes an internal chemical action in milk, it is of the greatest importance that the place where the cows are milked, and the persons employed should be of the greatest purity and cleanliness. The milking-house should be paved with stone or brick, and no litter or dung be permitted to remain in it. It should be washed out twice a day, immediately before each milking; which, besides ensuring cleanliness, produces a refreshing coolness highly useful to the milk. The teats of the cows should be washed clean with water and a sponge. The vessels in which the milk is drawn from the cow should be made of very clean white wood; they should be scalded immediately after having been used, and then exposed to the air, so as to be perfectly dry by the next time of using them. Tin or copper vessels are preferable to wood, because they are not so easily tainted, and are more easily kept clean. Where these are used they should always be kept bright within and without, by which means the least speck of dirt is immediately discovered.

The milk as soon as it is brought into the dairy is strained through a fine sieve or cloth, in order to remove any extraneous matter, and it is then poured into shallow pans, or troughs lined with lead. The best pans are of metal, either of iron carefully tinned, or of brass. Such pans are cool in summer, and in winter allow of the application of heat, which is often very useful to make the cream rise. When leaden troughs are used they are generally fixed to the wall, and have a slight inclination towards one end, where there is a hole with a plug in it, by drawing which the thin milk is allowed to run off slowly, leaving the cream behind, which runs last through the hole into the pan placed under to receive it. The milk in the pans or troughs is generally four or five inches in depth, which is found most conducive to the separation of the cream. The place where the milk is set should have a thorough draught of air by means of opposite wire windows. The sun should be carefully excluded by high buildings or trees, and the floor, which should always be of brick or stone, should be continually kept moist in summer, that the evaporation may produce an equal cool temperature. A small stove in winter is a great advantage, provided smoke or smell be most carefully avoided, and the temperature be carefully regulated by a thermometer. All these minutiæ may appear superfluous to those who have no practical knowledge of the dairy, and many dairymen, who cannot deny the truth of what we have stated, may excuse their deviation from these rules by saying, that good butter is made without so much care and trouble. This may be true, but they cannot ensure good butter at all times; and when cleanliness and order are brought to a regular system the trouble disappears. It is well known that even the complexion and temperament of a dairywoman are not a matter of indifference; and that however clean she may be, there are times when the insensible perspiration of her body will have a powerful effect on the milk. In Switzerland men are chiefly employed to milk the cows, and in all the process of the preparation of butter and cheese. The women only clean the utensils, and carry green food to the cows when they are kept in the stable. When the milk has stood twelve hours the finest parts of the cream have risen to the surface, and if they are then taken off by a skimming dish, and immediately churned, a very delicate butter is obtained; but in general it is left twenty-four hours, when the cream is collected by skimming, or the thin milk let off by taking out the plug in the troughs. All the cream is put into a deep earthen jar, which should be glazed, but not with lead: stone ware is the best. More cream is added every day till there is a sufficient quantity to churn, which in moderate dairies is every two days. It is usual to stir the cream often, to encourage a slight acidity, by which the process of churning is accelerated. This acidity is sometimes produced by the addition of vinegar or lemon-juice; but however this may facilitate the conversion of the cream into butter, we would not recommend it, as the quality is decidedly injured by it, especially butter which is to be salted. It has been asserted by some authors that butter will not separate from the butter-milk until acidity is produced, and, no doubt, there is more or less of lactic acid in all butter-milk: but perfectly fresh cream, which has stood only one night and is churned early next morning, will generally produce excellent butter in a quarter of an hour or twenty minutes in summer, and no acid taste can be discovered in the butter-milk. The change by which the butter is separated in a solid form is accompanied by the development of heat in churning. That the state of the atmosphere with respect to electricity as well as the temperature has a powerful influence on the making of butter, no one can doubt who has paid any attention to the effect of a thunderstorm in a dairy, especially when it occurs at the time of churning. As science becomes gradually applied to all the common arts of life some accurate experiments will probably be made to throw light on this subject, and an electrometer may be found as useful in a dairy as a thermometer is already.

The common method employed to separate the butter from the thinner portion of the cream is by strong agitation. In small quantities this may be done in a bottle; but the common instrument is the *churn*, which is a wooden cask rather wider at bottom than at the top, covered with a round lid with a hole in the centre. Through this hole passes a round stick about four feet long inserted in the centre of a round flat board with holes in it: the diameter of this board is a little less than that of the top of the churn. Various improvements have been made on this machine. The cream should not fill above two-thirds of the churn. By means of this stick held in both hands and moved up and down, the cream is violently agitated, passing through the holes in the board and round its edge every time the stick is raised or depressed, and thus every portion is brought into contact with the air. In the course of an hour's churning, more or less according to circumstances, small kernels of butter appear which are soon united by the pressure of the board against the bottom of the churn, and form a mass of solid butter. The butter is collected with the hand, and placed in a shallow tub for the next operation. The butter-milk is set aside for the pigs, or for domestic use. The butter is still mixed with some portion of butter-milk, but much of its quality for keeping depends on their perfect separation. The most usual way is to spread it thin in a shallow tub, beating it with the hand or a flat wooden spoon, and washing it repeatedly with clear spring water until all milkiness disappears in the water which is poured off. Some experienced dairymen pretend that the butter is deteriorated by much washing, and therefore express the butter milk by simply beating the butter with the hand, kept cool by frequently dipping it in cold water, or with a moist cloth wrapped in the form of a ball, which soaks up all the butter milk, and leaves the butter quite dry. This operation requires the greatest attention, especially in warm weather, and no person should work the butter who has not a very cool hand. The less it is handled the better, and therefore a wooden spoon or spatula is much to be preferred.

When it is entirely freed from the butter-milk and of a proper consistency, it is divided into portions of the weight required, if it is intended to be sold fresh. The mode of preparing fresh butter for the market is either by making it into *rolls* of two pounds, or into flat round cakes of one pound or half a pound each, which are impressed with some figure cut in a round piece of wood like a large seal, hence called *prints*. The rolls are made oblong with four sides slightly flattened by throwing the lump on a stone or board successively on each of the four sides, and then on the two ends. This requires some dexterity, which is soon acquired, and it is done to avoid unnecessary handling.

To make prints the butter is first made into balls, and then applied by pressure to the wood, which makes the impressions; the sides are trimmed up along the edge of the wood, and the whole is pressed against a marble or wooden slab, so as to have the impression uppermost, and form a flat cake. The wooden print is readily detached by holding it in the left hand, and giving a smart blow with the right upon it. A hole, bored through the centre, prevents the adhesion of the butter from the exclusion of the air. In Cambridgeshire butter is made up into rolls a yard long, and passed through a ring of a certain diameter, for the convenience of dividing it into small portions without the trouble of weighing. Hence the butter is said to be sold by the yard.

The greatest portion of the butter that is made, especially at a distance from large towns, is immediately salted and put into casks, which usually contain fifty-six pounds, and are called firkins. The quality of the salt used is of great importance; if it be pure, the butter will keep its flavour for a long time, but when it is impure and contains bitter and deliquescent salts the butter soon becomes rancid. The Dutch are very particular in this point. They use a kind of salt which is made by slow evaporation, and perfectly crystallized. The salt is intimately mixed with the butter. From 3 to 5 lbs. are sufficient for a firkin of 56 lbs.* The casks are made of clean white wood. They are carefully washed inside with strong brine made hot, and rubbed over with salt. The butter being quite dry is pressed close into the cask, a small layer of salt having been first put on the bottom. Every addition is carefully incorporated with the preceding portion. If there is not a sufficient quantity to fill the cask at once, the surface is made smooth, some salt is put over it, and a cloth is pressed close upon it to exclude the air. When the remainder is added, at the next churning, the cloth is taken off, and the salt, which had been put on the surface, carefully removed with a spoon. The surface is dug into with a small wooden spade, and laid rough, and the newly-salted butter is added and incorporated completely. This prevents a streak, which would otherwise appear at the place where the two portions joined. When the cask is full some salt is put over it, and the head is put in. If the butter was well freed from all the butter-milk, and the salt mixed with it quite dry, it will not shrink in the cask, and it will keep its flavour for a long time. Should there be an appearance of shrinking, the cask must be opened, and melted butter poured round it so as to fill up the interstices between the butter and the cask; in this way it will not suffer in its quality. There is a mode of preserving butter for domestic use without salt, in the following manner:—the butter is set in a clean pan over the fire and melted very gently; it is not allowed to boil, but is heated very nearly to the boiling point. Experience has shown this heat to be attained when the reflection of the white of the eye is distinctly seen on the surface of the butter on looking down into the pan. All the watery particles are then evaporated, and the curd, of which a portion always remains in the butter, and which is one cause of its becoming rancid, falls to the bottom. The clear butter is poured into an earthen vessel and covered over with paper, and a bladder or a piece of leather is tied over the jar to exclude the air. When it is cooled it much resembles hog's lard. It has lost some of its flavour, but it is much superior to salt butter for culinary purposes, and especially for pastry.

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* The following mixture has been found superior to salt alone in curing butter;—half an ounce of dry salt pounded fine, two drams of sugar, and two drams of saltpetre, for every pound of butter.

The Devonshire method of making butter differs materially from the common process which we have described, and is peculiar to that county. The milk, instead of being set for the cream to rise, is placed in tin or earthen pans, holding about eleven or twelve quarts each. Twelve hours after milking these pans are placed on a broad iron plate, heated by a small furnace. The milk is not allowed to boil, but a thick scum rises to the surface. As soon as small bubbles begin to appear, where a portion of this is removed with a spoon, the milk is taken off and allowed to cool. The thick part is taken off the surface, and this is called *clouted cream.* It is a sweet pleasant substance, more solid than cream, but not so solid as butter; and is considered as a dainty by all those who have been early accustomed to it. A very slight agitation converts it into real butter; after which it is treated exactly as we have before described. It does not appear that there is any peculiar advantage in the Devonshire method.

Another method of making butter, which is more generally adopted, is to churn the milk and cream together. This method is pursued in parts of Holland, Scotland, and Ireland, and is said to produce a greater abundance of butter from the same quantity of milk. In the Dutch method the milk is put into deep jars in a cool place, each *meal,* or portion milked at one time, being kept separate. As soon as there is a slight appearance of acidity the whole is churned in an upright churn, which, from the quantity of milk, is of very large dimensions. The plunger is therefore worked by machinery moved by a horse, or sometimes by a dog walking in a wheel, which he turns by his weight. When the butter begins to form into small kernels, the contents of the churn are emptied on a sieve, which lets the butter-milk pass through. The butter is then formed into a mass, as described before. In Ireland the process is very similar, but the milk is allowed to arrive at a greater degree of acidity, which is a defect.

In Scotland the following method is pursued: the milk is allowed to cool for six hours, and then put into a clean vat. As long as it remains sweet more milk may be added, but not after any acidity is produced. It is then covered and allowed to get sour, till it coagulates at the top; this coagulum is called the *lapper,* which must not be broken till the butter is churned. When the clotted milk is put into the churn, warm water is added so as to raise the temperature to 70° or 80°, the whole being gradually stirred in. When this is properly conducted the butter-milk will be very pleasant and wholesome, with a sub-acid taste, the serum and curd not being separated from each other for some time after. The butter is said to be fully equal to that made from cream alone. (*Quarterly Journal of Agriculture,* December, 1834.)

Butter is a most valuable article of commerce, and a great source of wealth to those nations which produce it in the greatest perfection. The Dutch have hitherto had the pre-eminence: but there is no good reason why the rich pastures in England and Ireland should not produce as good butter as those of Holland, if sufficient attention were paid to the minutiæ of the dairy, to the purity of the salt used, and especially to cleanliness, for which the Dutch are so remarkable. The quality of the butter depends on some very minute circumstances, which escape the notice of all superficial observers. The smallest particle of putrescent matter, accidentally added, and even mere effluvia, give a turn to the chemical action going on from the moment the milk is exposed to the air, and they taint the cream more or less. The quantity of pure cream which rises when the milk is set in the pans, as well as its quality, is influenced by these circumstances. When the milk curdles before the cream is separated, it is almost impossible to prevent some portion of the curd being mixed with the butter. In its perfectly fresh state the taste is not affected by this; but the butter will not keep fresh above twenty-four hours, and when salted soon becomes rancid. Thus a greater quantity is produced, but of inferior quality. When cheese is made of the milk from which the cream has been taken, it will be found most profitable not to attempt to take off all the cream by repeated skimming; for more will be gained in the better quality of the cheese, than by an increase in the quantity of the butter, at the expense of the quality.

It is an acknowledged fact, that such are the niceties of the dairy, that great experience alone can ensure a produce of superior quality, and this experience would be more readily acquired if the circumstances were accurately observed and noted. We would recommend to those who have extensive dairies to mark by the thermometer the temperature of the milk and cream in the different stages of the process: occasionally to test the acidity of the butter-milk by means of alkalis; and to note any peculiarity in the atmosphere by an electrometer. A few observations carefully noted, repeated, and compared, would throw more light on the true causes which favour or oppose the production of good butter, than all the guesses that have hitherto been made.

The quality of the butter depends materially on the nature of the pasture. The best is made from cows fed in rich natural meadows. Certain plants which grow in poor and marshy soils give a disagreeable taste to the butter. The common notion that the yellow flower called the butter-cup gives colour and flavour to butter is a mistake: cows never crop the flower if they can avoid it, and the whole plant is acrid and unpalatable. When cows are fed with cut grass in the stable the butter is inferior, except in the case of some artificial grasses, such as lucerne. Turnips and other roots given to cows in winter communicate more or less of a bad taste to butter, which is corrected in some degree by means of a small quantity of water and saltpetre added to the milk; and also, it is said, by giving salt to the cows with their food. But there is no butter made in winter equal to that which is made where the cows are fed entirely with good meadow hay, especially of the second crop, called after-math hay, which contains few seed-stalks. [AFTERMATH.]

The yellow colour of fine May butter is frequently imitated artificially by mixing some ground annotta root, or the juice of carrots, with the cream. This is easily detected by the taste of the butter, which is not improved by it, and has not the peculiar flavour of fine grass butter: but in other respects it is a harmless addition. Some cows give a much yellower cream than others, especially the Alderney cows; and the butter made from it is of a peculiarly fine flavour. When a cow has lately calved the milk is also much yellower, but this soon goes off, if it be not the natural colour; and the butter made by mixing this with other milk, although of a deeper colour, is not improved by it.

According to the accounts of the produce of butter from different countries and various breeds of cows, we may state that, on an average, four gallons of milk produce sixteen ounces of butter; and to make the feeding of cows for the dairy a profitable employment in England, a good cow should produce six pounds of butter per week in summer, and half that quantity in winter, allowing from six weeks to two months for her being dry before calving; that is, 120 lbs. in twenty weeks after calving, and 80 lbs. in the remainder of the time till she goes dry,—in all about 200 lbs. in the year. If she produces more she may be considered as a superior cow, if less she is below par. To produce this quantity the pasture must be good, and if we allow three acres to keep a cow in grass and hay for a year, which is not very far from the mark, the butter made will produce about 10*l.*, at the distance of fifty miles from London, if it is sold in a fresh state, and the calf about 15*s.* at a week old. This does little more than pay rent and expenses; the profit must be made by feeding pigs, or making skim-milk cheese.

An inferior kind of butter is made in some cheese dairies from the oily portion of the milk skimmed from the whey, which is set in pans like milk after the cheese has been made. It is sold at an inferior price to labourers, and seldom comes to market. It is totally unfit for salting and keeping. It is known by the name of *whey butter*.

BUTTER-TRADE. Butter is an article of great commercial importance in many countries, and especially in India, where, under the name of *ghee*, it forms one of the staple productions of many districts. In Europe the greatest trade in butter belongs to the more northern nations. The quality of that produced in England and in Holland is considered the best in the world. A considerable quantity of Dutch butter is exported, but all that is produced in England is consumed at home, in addition to large quantities imported from Ireland and the north of Europe. The quantity so imported has been for some time progressively increasing.

				From Ireland Cwts	From Foreign Countries Cwts
Ann. average of	3	years to	1790 . . .	198,149	——
			1800 . . .	215,100	——
			1805 . . .	225,187	107,169
			1810 . . .	303,586	72,421
			1815 . . .	330,635	67,450
,,	5	,,	1820 . . .	365,226	60,627
,,	5	,,	1825 . . .	422,883	159,332
,,	5	,,	1830 . . .	——	173,206
,,	5	,,	1835 . . .	——	131,346

No account of the importations from Ireland can be had later than 1825, the intercourse between the two islands having then been placed upon the footing of a coasting trade; and there is no statement of imports from foreign countries of an earlier date than 1801. In 1834, the latest year for which the accounts of the trade with different countries have been made public, the importations, which amounted to 133,871 cwts., were received from the following countries: *viz.*, Russia, 1 cwt.; Denmark, 8846 cwts.; Prussia, 5 cwts.; Germany, 17,693 cwts.; Holland, 106,776 cwts.; Belgium, 526 cwts.; France, 2 cwts.; Italy, 4 cwts.; other countries, 19 cwts.: total, 133,871 cwts.

It is not possible to state the quantity of butter exported from the United Kingdom to our colonies and foreign countries, in consequence of the practice at the custom-house of including butter and cheese in the same statement. The shipments of butter so made are entirely of the produce of Ireland. The chief customer is Portugal; next to that country Brazil takes the largest quantity; and about 40,000 firkins, or 1000 tons, are annually sent to the English West India colonies.

Various acts of parliament have been passed with the view of preventing fraudulent practices in the packing of butter, but such legislative interference seems unnecessary.

The average contract price for butter purchased for the use of Greenwich Hospital at various times since 1730 has been as under:—1730, 5*d.* per lb.; 1740, 5*d.*; 1750, 5⅛*d.*; 1755, 5½*d.*; 1760, 5⅓*d.*; 1765, 5½*d.*; 1770, 6⅓*d.*; 1775, 6⅝*d.*; 1780, 6⅛*d.*; 1785, 6¾*d.*; 1790, 6½*d.*; 1795, 8¼*d.*; 1800, 11⅓*d.*; 1805, 11¾*d.*; 1810, 13¾*d.*; 1815, 14*d.*; 1820, 9⅓*d.*; 1825, 10½*d.*; 1830, 6½*d.*; 1834, 7¾*d.*

The rates of duty payable at different times during the present century on the importation of butter from foreign countries have been varied as follows:—1801, 2*s.* 9*d.* per cwt., and 3 per cent. ad valorem; 1803, 3*s.* 6¾*d.* per cwt.; 1804, 3*s.* 11⅓*d.*; 1805, 4*s.*; 1806, 4*s.* 3½*d.*; 1809, 4*s.* 4*d.*; 1813, 5*s.* 1¾*d.*; 1816, 20*s.*; at which last-mentioned rate it has been continued to the present time (1836).

BUTTER. [DIET.]

BUTTER TREE. [BASSIA.]

BUTTER AND TALLOW TREE. [PENTADESMIS.]

BUTTERFLY. [LEPIDOPTERA.]

BUTTERFLY PLANT. [ONCIDIUM.]

BUTTERFLY ORCHIS. [PLATANTHERA.]

BUTTERMERE, a chapelry of the parish of Brigham, in Cumberland, much frequented by travellers for the sake of the beautiful lake which bears its name. This lake is about 1¼ mile long, and ½ mile broad: a swampy flat, partly meadow-land, partly under the plough, intervenes between it and the grand hill at the head of the valley, called Honistar Crag. Another level tract, about a mile long, separates it from the fine sheet called Crummock Water; the chapel and village of Buttermere stand at some little elevation on the E. side of the valley, between the two lakes. The number of inhabitants, who are chiefly employed in pasturage and agriculture, is thus given in the population returns:—

1801.	1811.	1821.	1831.
74	109	136	89

exhibiting a remarkable decrease, which is corroborated by a decrease in the number of inhabited houses from 21, in 1821, to 19. The chapelry contains 3480 acres. Slate quarries have been worked in Honistar Crag; but not, we believe, for the last few years. The river Cocker rises at the head of the valley, traverses both lakes, and falls into the Derwent at Cockermouth.

There is a tolerably good road from Cockermouth and Lorton, by Crummock Water, to Buttermere, which is continued, as a mountain road, to Seatollar. (BORROWDALE.) There is a road through the Vale of Newlands to Keswick, distant about 9 miles, but it is not suited for heavy carriages, being rough, narrow, and for 2 miles extremely steep. The mountains which inclose this valley belong, on the E. side, to the lowest, those on the W. side and end to the middle, slate-formation, and the smooth conical shapes of the former are remarkably contrasted with the abrupt outlines of the latter. The whole tract, from the foot of Crummock upwards, presents a good specimen both of the sterner and softer features of mountain scenery. About a mile down Crummock, and half a mile from the W. side of the lake, a small stream, falling over a precipice of 156 ft., forms the waterfall of Scale Force. Near its foot, and past Floutern Tarn, over a low but wide moor, runs the ordinary footway for those who cross from Buttermere to Ennerdale. From the upper end of Buttermere there runs another mountain path of much bolder character, over the pass called Scarf Gap, descending into the head of Ennerdale (here called Gillerthwaite), then mounting the Black Sail and running rapidly down Mosedale to Wasdale Head. The writer has crossed these passes with a lady on a clever pony; but the ground is difficult, and a considerable part of it must be done on foot: to those who can walk, a horse will be more plague than profit. From Buttermere down to Wasdale Head may be from 8 to 9 miles: from thence to the next public-house, below the foot of Wastwater, is 4 miles more. It is a route of great variety and grandeur.

BUTTERS, VEGETABLE, the name given to the concrete oil of certain vegetables, from its resemblance to the butter obtained from the milk of animals, and from being employed for similar purposes. The term is also occasionally, but improperly, applied to some vegetable products which are entirely of a waxy nature, such as the wax of the *Myrica cerifera*. The name is likewise bestowed in Siberia on certain algæ, species of the genus *Nostoc*, such as *N. pruniforme*. The most important vegetable butters are produced by the *Bassia butyracea* and other species of that genus (*Bassia*) and certain palms, such as the *Cocos butyracea* and the *Elais Guineensis*, the former of which is of great utility to the inhabitants of Brazil, where it grows naturally, and to the negroes of St. Domingo, where it is cultivated; while the latter is very serviceable to the natives of Guinea. (*Library of Entertaining Knowledge; Vegetable Substances; Materials of Manufacture*, p. 221.)

BUTTERS (in pharmacy) was the name formerly given to certain hydrochlorates of the metals, such as antimony, arsenic, bismuth, tin, and zinc. Precipitated sulphur likewise was termed butter of sulphur. These designations are now nearly obsolete.

BUTTMANN, PHILIP KARL, an eminent scholar and mythologer, was born on the 5th December, 1764, at Frankfort on the Main. In the latter part of his life he dropped his second Christian name, but they both appear on the title-pages of his earlier works. He was descended from the French Protestants who took refuge in Germany from the persecutions of Louis XIV., and his name is a German representative of the French Boudemont. His father, Jacob Buttman, a respectable stationer, placed him, at an early age, under the care of Purman, the learned rector of the gymnasium of his native place, in which he first acquired that taste for philological studies and that love for the Greek language in particular for which he was distinguished through life. In 1782 he went to Göttingen to follow up his classical investigations under the superintendance of Heyne. In 1786, after a short stay at Frankfort, he visited his brother-in-law, Dr. Ehrmann of Strasbourg. There he became acquainted with Schweighäuser, who was then engaged on his edition of 'Polybius,' and Buttmann made his first appearance as a philologer in some notes which he furnished to that laborious work. Shortly after he was appointed geographical teacher to the young prince of Anhalt Dessau, in which situation he remained for about eight months. In 1788 he went to Berlin, and had the good fortune to make some literary acquaintances in that city, which led to his being appointed, in a year or two, assistant librarian to the king, and he added to his rather inadequate salary by taking private pupils, and writing for the booksellers. The former employment made him acquainted with the various errors of the Greek grammars then in use, and with their uselessness as text-books for beginners. Accordingly, in 1792, he published a short Greek grammar, which was so superior both in matter and manner to every former book on the subject, that it at once established itself in all the schools of Germany; and even now, after a lapse of more than 40 years, it is the only accidence used in the gymnasia of that country. Buttmann was appointed, in 1796, secretary to the royal library, and four years afterwards he was made a professor in the Joachimthalsche gymnasium, the high school of Berlin; he held this appointment till 1808, when he was appointed one of the original professors in the new university. He was elected a member of the royal academy of sciences in 1806; but so great was his reputation, that his 'Essay on Apollo and Artemis' was inserted in the transactions of that society three years before he entered it. Shortly after his appointment as professor in the university he was selected from his colleagues as classical tutor to the prince royal. After Spalding's death, in June, 1811, Buttmann was elected his successor as secretary to the historical philological class of the royal academy of sciences; but he felt this office so irksome, that nothing but his regard for the interests of the academy could have induced him to retain it; for, as Schleiermacher observes ('Gedächtnissrede auf Philipp Buttman,' p. xxi.), 'he never had any inclination for public business, partly because he abhorred complicated responsibilities, partly because he had a well-founded aversion to all mere formalities.' The peculiar constitution of the society, however, induced him to accept this appointment, and his panegyrist adds that he introduced many convenient abridgments of formalities without departing from essentials. In 1821 he was appointed head librarian to the king, and in 1824 was made a knight of the Prussian Red Eagle of the third class. From this year till his death he was afflicted with repeated attacks of apoplexy: he died on the 21st June, 1829. Buttmann was married, in 1800, to the eldest daughter of Dr. Selle, the king's physician, by whom he left a family: his son Augustus is a good scholar, and republished, in 1833, his father's well-known edition of 'Demosthenes' Oration against Midias.' Buttmann wrote his own life, up to the time of his becoming a member of the Berlin academy, in the third part of Löwe's collection (Bildnisse jetzlebender Berliner Gelehrter mit Selbstbiographien).

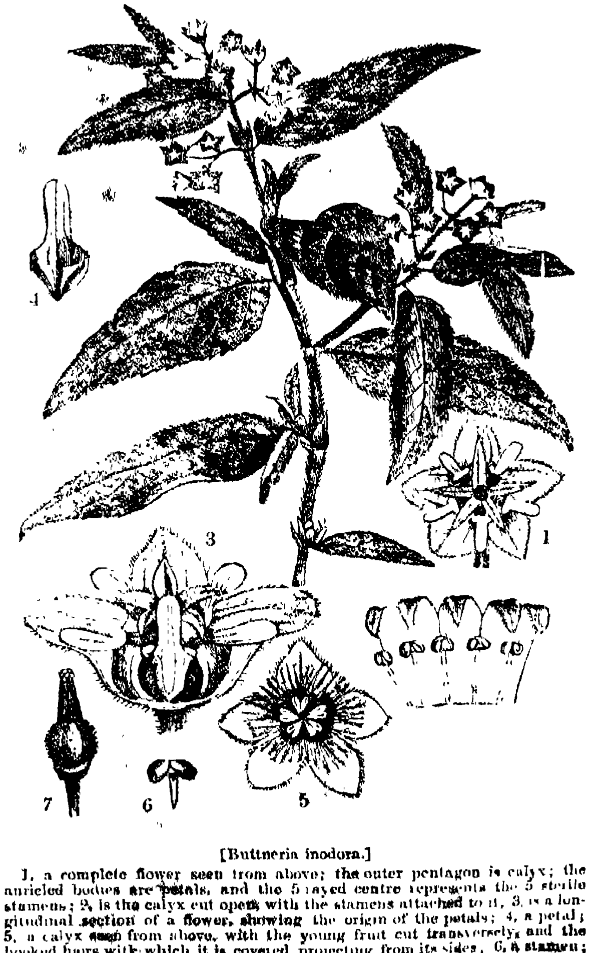
The best known of Buttmann's writings are:—I. His three celebrated Grammars: (1), the School Grammar, which has been very badly translated in America; (2), the intermediate Greek Grammar, which has been twice translated—once by Boileau, Lond., 1833, and also by the American professor Robinson; (3), his complete Greek Grammar, which only contains the Accidence: unfortunately it is not yet accessible to the English student, though it is far superior to Matthiä as a collection of facts with regard to the formal part of the Greek language.

II. His 'Lexilogus,' which has been well translated by Mr. Fishlake.

III. His 'Mythologus;' a collection of his mythological and historical essays.

The most remarkable feature in Buttmann's literary character was his willingness to give assistance to other writers. He began with assisting Schweighäuser; and Heindorf, Biester, Wolf, Spalding, and Niebuhr, successively received and acknowledged his valuable aid. In all his literary labours Buttmann was distinguished for an honest and discriminating scepticism: he never doubted, however, but with a wish to find out the truth, and in contriving methods of fathoming a difficulty he never was exceeded in ingenuity. His private character was very amiable, and doubtless Schleiermacher was justified in saying that 'there was hardly one in the circle of his literary acquaintances so well known, so unanimously appreciated, and so entirely beloved as he was.'

BUTTNERIA'CEÆ, a group of plants, by some botanists considered a distinct natural order; by others reduced to a section of Sterculiaceæ. They belong to the malval alliance of Exogens, and are readily known by their petals being bagged at the base, their stamens partly sterile and petaloid, and their fruit covered with hooked spiny hairs. From Sterculiaceæ Proper, they differ by the presence of petals, and their stamens not being united into a column; from Malvaceæ, by their two-celled anthers and bagged petals; and from Lasiopetaleæ, by their calyx not being coloured like a corolla, and their petals not rudimentary. The species are chiefly inhabitants of tropical countries; they partake of the mucilaginous inert properties of Malvaceæ; their bark often yields a tough fibre fit for manufacture into cordage; and one species, Theobroma Cacao, produces the seeds from which the buttery and somewhat bitter substance called cocoa is obtained, and which, mixed with vanilla, forms the basis of chocolate.



[Buttneria inodora.]

1, a complete flower seen from above; the outer pentagon is calyx; the auricled bodies are petals, and the 5 rayed centre represents the 5 sterile stamens; 2, is the calyx cut open, with the stamens attached to it, 3, is a longitudinal section of a flower, showing the origin of the petals; 4, a petal; 5, a calyx seen from above, with the young fruit cut transversely, and the hooked hairs with which it is covered projecting from its sides. 6, a stamen; 7, the ovary.

BUTTON. This useful little appendage to almost every dress is made of nearly every variety of material. Gold, silver, brass, copper, pewter, mother-o'-pearl, hard wood, bone, ivory, horn, leather, paper, glass, silk, wool, cotton, linen, thread, are all formed into buttons, and the manufacture is carried on to a very great extent.

The varieties of the form of buttons may be reduced to four, viz. 1. those *with shanks;* 2. those *without shanks;* 3. those on *wire moulds* (or rings); and 4. buttons *covered* with silk, cloth, or other material.

1. Metal buttons with shanks are generally punched out of a plate of brass having rather less zinc in its composition than ordinary brass. The disks so punched out, after having their edges trimmed to take off the burr, are ready for the shank. The shanks are made of wire by a most ingenious machine invented by Thomason of Birmingham. A coil of wire is placed in the machine, one end of which gradually advances to a point where a pair of shears cuts off a piece of the requisite length; a stud then presses against the middle of the piece and forces it between the two jaws of a vice into a staple-like form: the jaws then compress it so as to form the eye of the shank: a little hammer then strikes the end and makes it level, and another movement finally drops it complete into a box.

The shanks being placed upon the disk in their proper position, and kept there by a bent flat slip of iron, a small piece of solder is placed at the foot of the shank. In this state 100 or more are put upon an iron plate and heated in an oven till the solder runs and fixes the shank. They are then turned separately in a lathe, the chuck of the lathe being so formed as to allow the buttons to be put in and taken out with great facility. The gilding is performed with an amalgam of gold and mercury about the consistence of butter: five grains of gold are sufficient for a gross of buttons.

White metal buttons, such as those on soldiers' dresses, are cast in moulds, containing ten or twelve dozen, and the shanks are placed in the moulds previous to casting, so that when the buttons are cast the shanks are fixed at the same time.

Mother-o'-pearl buttons are cut out of the pearl shell by means of a small cylindrical saw, *i. e.* a tube of steel with its edge cut into teeth. This tubular saw has a pulley on the tube, and it is made to revolve rapidly after the manner of a lathe. The shell is then pressed up against it, and thus the circular disk for the button is quickly cut out of the shell; if the shell is thick the circular disk may be split into two; the disks are then turned in a lathe. As the shanks cannot be soldered in, and they would not look neat if rivetted through the button, a hole is turned about half way through, the hole being wider at the bottom than at the top, or, as it is called, dove-tailed. The stem of the metal shank is just the size of the smallest part of the hole, and the stem is made a little hollow by drilling a conical hole up it, so as to leave the metal very thin at the edges. The shank being now put into the dove-tailed hole, a slight blow with the hammer spreads the thin edge of the stem under the dove tailed edge of the hole, and the shank is firmly fixed. Mother-o'-pearl buttons are sometimes ornamented with excentric circles, flutes radiating from the centre, &c., all of which are executed in the lathe by means of an excentric chuck and slide rest.

2. Buttons without shanks are made of mother-o'-pearl, wood, bone, metal, &c., the metal ones being stamped and the rest turned. They have four holes through which the thread is passed to fix them on the garment. These holes are stamped in metal buttons, but they are drilled in those which are made of other materials. The holes are drilled while the buttons are in the lathe: four long drills are made to converge towards the button, and thus the four holes are all drilled at once.

3. Buttons on wire moulds are merely wire rings covered with thread.

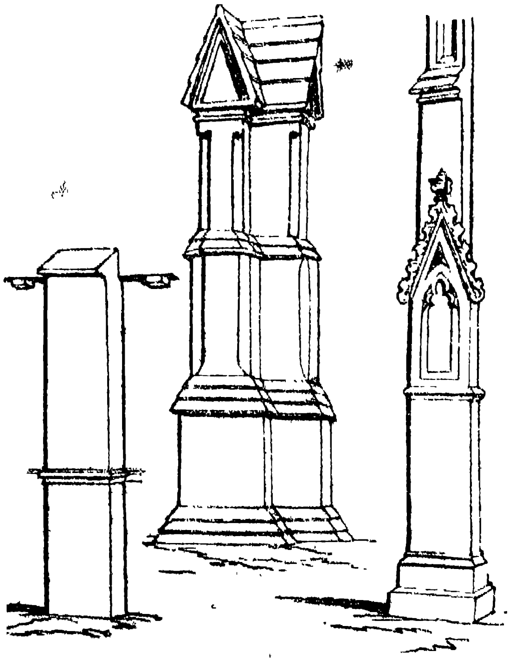
4. Covered buttons. Although many beautiful specimens of metal buttons have been produced by the manufacturer, still *metal* buttons may be said to be in great measure superseded by covered buttons. The stimulus being thus given, a great deal of ingenuity has been shown in the manufacture of covered buttons, and a number of patents have been obtained for the inventions: the following two plans will give a general idea of the principles of their construction. In one plan a metal disk is punched out of thin iron plate, which by subsequent punches has its edges turned up and then bent a little inwards: this is done to form the body of the button. Another smaller disk, capable of lying within the edges of the above, has a round or oval hole in the centre: this is to form the back. A circular piece of the stuff called florentine is then wrapped round the larger disk, and the edges brought over and pressed into the hollow; the smaller disk or back is then pressed into its place, and then the turned-up edges of the face being compressed on the back, the whole becomes firmly fixed together, and the cloth protruding through the hole in the back affords the means of fixing it to the garment. In the other plan, which produces a very neat button, the disk for the body is left flat, and the back is a small circular disk with a round hole in the centre, but the outer edge is cut into eight sharp triangular points like a little star. These points are bent to a little less than a right angle to the disk, so that the points incline a little inwards. Besides these two metal disks, three pieces of paper and two pieces of cloth are necessary, so that the button consists of no less than seven separate pieces, which are put together in the following order:—1st. On the piece of florentine which forms the outer covering is laid a piece of paper of the same size; on this the iron disk forming the body; on this another piece of paper the same size as the body; on this another piece of paper crumpled up into a little pellet to help to form the shank; on this a piece of coarse cloth; and finally the metal back. In putting on the back the florentine is gathered up over the whole of the materials, and then the points of the back are pressed into it; and as the points of the back are bent a little inwards (as was mentioned above), the consequence of the pressure is, that as they enter the cloth they bend more and more inwards, and thus form eight little *hooks* which very neatly and effectively hold the whole together. The little paper pellet makes the cloth protrude through the hole in the back, and forms the cloth shank by which it is attached to the coat. Almost the whole of these processes are performed by punches of various forms, but it has even been proposed to do the whole by a machine, and a patent has been taken for one in which by placing two plates of iron, a roll of florentine, a roll of cloth, and three rolls of paper, and by setting the machine in motion, the whole of the seven parts of this ingenious button are to be cut out, put in their respective positions, and combined together into a perfect button.

A very beautiful and perfectly novel steel button has been lately produced by Mr. Barton of the Royal Mint. It is intended for court dresses, being far too delicate and too expensive for ordinary purposes. By means of most accurate dividing machinery, a number of groups of fine lines are engraved on the button, the graving point being the splinter of a diamond;—the machine is so accurate, that 10,000 lines can be drawn within the inch. The groups of lines may be disposed in triangles or hexagons, after the manner of a honeycomb, or in any other form at the option of the artist, or the lines may be made to cross each other in any direction. The pattern is comparatively of little importance, the beautiful effect being produced by the brilliant reflection of the light, which exhibits all the colours of the rainbow in playful clouds like mother-o'-pearl, or in intense colour like the ruby or the emerald.

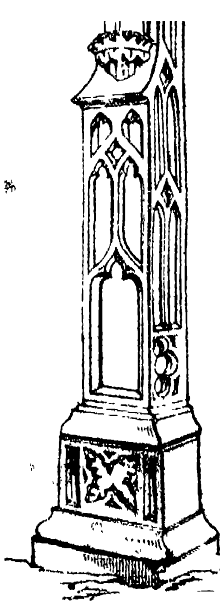
BUTTON, THOMAS, one of the early arctic navigators, was an able seaman in the reign of James I., whose son (the Prince Henry) seems to have been his first patron. In 1612, about three years after the unhappy death of the navigator Hudson, the merchants of London engaged Button to follow up Hudson's discoveries with two ships, the Resolution and the Discovery. He was accompanied on this expedition by Bylot and Pricket, who had sailed with Hudson, their experience and high qualities as seamen being considered sufficient in those days to outweigh the suspicions of their having partaken in the mutiny that deprived Hudson of life. Crossing the Atlantic, Button entered Hudson's Straits to the south of Resolution Islands, and then keeping without deviation a western course, he reached Southampton Island. Sailing still to the west, he fell in with the American continent, in lat. 60° 40′. From this point of the main land, which he named 'Hope Checked,' he made away to the south, and on the 15th of August, 1612, he discovered the mouth of Nelson's River, in lat. 57° 10′. At this point, which subsequently became the chief establishment of the Hudson's Bay Company, Button determined to winter. To secure his ships against the icebergs, he caused strong piles to be driven into the sea. To keep his men warm, he had three large fires constantly burning in each of his vessels. Notwithstanding all his precautions, several of the sailors died, and he himself had a severe illness. Button, like Captains Franklin, Parry, and Back, who have recently visited those inhospitable regions, showed great ability in amusing his men, in order to keep up their spirits against the depressing effects of inactivity: he proposed to them questions connected with navigation and mathematics, and thus mingled instruction with amusement. On the return of spring, he employed his ships' companies in killing game, which was so abundant; that 1800 dozen of white partridges were brought in during their stay there.

The river thawed on the 16th of February, and in two months, the sea being clear of ice, he explored the bay in the neighbourhood of Nelson's River, and named it Button's Bay. He then went north as far as lat. 65°, and fell in with a cluster of islands, which he called Mancel's Islands (now Mansfield's). Proceeding to Cape Chidley, he discovered the passage between that cape and Labrador, and thence reached England in sixteen days, in the autumn of 1613. He was the first navigator that reached the eastern coast of America through Hudson's Straits. It is to be regretted that he never published an account of his voyage; all that we have of his journal is an extract in Purchas. The government of the day made him a knight, but neither they nor the merchants of London ever employed him again to prosecute those discoveries for which he had shown so much aptitude, skill, and judgment. (Purchas, *his Pilgrims;* Cooley, *Hist. Maritime Discoveries.*)

BUTTRESS, a projecting support to a wall, most commonly applied to churches in the Gothic style, but also to other buildings, and sometimes to mere walls. Buttresses are usually finished with a sloping top, and divided into several heights, each of which projects less from the wall as they ascend: each projection is usually covered with a sloping side or sides, similar to a roof. The buttresses of Gothic buildings are variously decorated. Norman buttresses, which came into use probably from the time of the decay of Roman architecture, are plain broad faces slightly projecting from the wall of the building to which they belong. In appearance they are very similar to the shaft of a pilaster, from which they most probably derive their origin. The top of these buttresses is terminated by an inclined plane moulded underneath on the front face only. The bands which often occur in Norman buildings as a sort of capping to the basement of the wall [BASEMENT] are often continued round the sides of the buttress, thus making the lower part of the buttress as it were a pedestal to the upper part, or more properly to the pilaster. In decorated buildings, Norman buttresses are sometimes ornamented at the angles with columns, as at Castle Rising castle, Norfolk. But these decorations are most probably of a later date. An additional resemblance to the Roman pilaster appears in these buttresses, when they are found with a narrower face projected on the broader buttress. Castle Rising and Norwich castles contain good examples of Norman buttresses. Of early English buttresses, which immediately succeeded the former, Mr. Rickman distinguishes four kinds. The *first* is a flat buttress, narrower than the Norman, with mouldings more delicate, but very similar to, and hardly to be distinguished from the Norman. The *second* is a buttress projecting at times nearly as much as its breadth; at others, more than the breadth of the buttress. These buttresses sometimes are without set-offs, or have only one forming a division in the whole height. There are buttresses at Salisbury which belong to this class, and are highly enriched with niches and decorated with ornaments, but they have a very weak appearance. The *third* kind consists of long slender narrow buttresses, with a considerable projection divided into several heights. Mr. Rickman remarks that they are not common: they occur in



A, Norman Buttress. B, Early English Buttress. C, Decorated English Buttress.

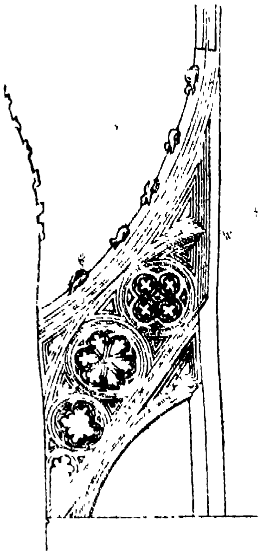


[Perpendicular English Buttress, Woolpit, Suffolk. Decorated English Buttress, Waltham Cross.]

some towers. The *fourth* kind of buttress of this period, and perhaps the latest, is divided into stages or divisions receding one behind the other; but this also is not common. Like all the former, it is finished with a triangular top, similar to the roof and gable ends of a building. These two last kinds are very similar in character.

Mr. Rickman is of opinion that about the close of this period, flying buttresses were first constructed, being thrown from the side aisle buttresses to the buttress of the nave and choir. He cites Salisbury and Chichester cathedrals as examples. Early English buttresses have generally pyramidal tops; the sides of these buttresses are sometimes splayed at the edges, with pedestal-like bases. The shaft also is at times divided into one or more divisions, as at Lincoln.

Beverley minster has columns at the angles of the buttresses, with a niche in the pyramidal head. The decorated English buttresses which succeeded these present many varieties: they exhibit some of the leading features of their predecessors, but are generally highly enriched. These buttresses, when used at the angles of buildings, are often applied diagonally to the angle. Mr. Rickman observes that the decorated buttress is finished in a variety of ways; 'some slope under the cornice, some just through it, and some run up through the battlement and are finished with pinnacles of various kinds.' He mentions three examples of rich buttresses of the decorated style; one in the west front of York minster, another at the east end of Howden church, Yorkshire; a third at the east end of Walsingham priory. This last is almost in the perpendicular style, which immediately followed the decorated. The decorated buttresses are enriched with pannels, niches, and a variety of ornaments. Perpendicular English buttresses, used externally, vary but little from those which preceded them, except as to the freedom of design, in which they are inferior. The triangular or roofed heads are seldom used. Mr. Rickman observes that there are few large buildings of this last period without flying buttresses; and also that the small buttresses of this style attached to screen-work, stall-work, and niches are different from any before-used, and mark the period distinctly. Octagonal turrets are sometimes used as buttresses, as in Henry VII.'s chapel at Westminster, from which spring the flying buttresses. The most superb of this kind ever executed in this country belong to this edifice. For a variety of details relative to buttresses, we refer the reader to Rickman's 'Attempt to discriminate the Styles of Architecture in England from the Conquest to the Reformation.' Britton's 'Ecclesiastical Architecture' contains several good examples of buttresses.



[Flying Buttress, from Henry VII's Chapel, Westminster.]

BUTY'RIC ACID occurs not only in butter, but in the gastric juice and urine. In order to obtain it, butyrate of barytes (which is formed by a tedious process) is to be mixed with one-and-a-third time its weight of phosphoric acid of specific gravity 1·12; the butyric acid set free, redissolves in the liquor, which is to be repeatedly shaken with æther to combine with the butyric acid; the æther being distilled with a gentle heat, butyric acid remains.

The properties of this acid are, that it is a colourless liquid, its smell is acid, penetrating, and analogous to that of rancid butter. Its taste is acrid and biting, with a sweetish after-taste, like that of nitric æther. Its specific gravity at 75° Fahrenheit is 0·9765. It remains fluid at 16° Fahrenheit. Its boiling point is lower than that of water. It combines with water, and with anhydrous alcohol, æther, and fixed oils, in all proportions. When exposed to the air it evaporates gradually without leaving any residue. When distilled it absorbs the oxygen of the air in the retort, and decomposes, leaving coaly matter.

It is composed nearly of

Carbon	62·3	or 8	equivalents.
Oxygen	30·6	or 3	,,
Hydrogen	7·1	or 6	,,
	100·0		

Butyric acid combines with different bases to form various butyrates; they are all artificial compounds, and no one is applied to any use: instead therefore of giving an account of the individual salts, their general properties only will be mentioned. When dry they are usually inodorous, but if moist they emit a smell of butter. When the dry salts are subjected to a strong heat they are decomposed, and yield carburetted hydrogen gas, carbonic acid gas, and an empyreumatic oil, of an orange-yellow colour and an aromatic odour, while the base of the salt is left mixed with charcoal. These salts are easily recognized by the characteristic odour of butyric acid, which is emitted when a very small quantity of the salt is moistened with concentrated sulphuric acid.

BUTYRINE, a peculiar oleaginous matter, discovered by Chevreul, in butter, in which it exists combined with oleine and stearine, and a very small quantity of butyric acid. In order to prepare it, butter must be first separated from butter-milk by melting and pouring it off, and the butter thus purified is to be allowed to cool very slowly in a deep porcelain vessel, and then it is to be exposed for some days to a temperature of 65° Fahrenheit; by this treatment a large quantity of stearine is separated, crystallized in small grains, and an oily compound is obtained, which is to be carefully filtered, and then put into a glass vessel with an equal weight of alcohol of specific gravity 0·796, and kept at the temperature of 66°. The mixture is to be frequently shaken during 24 hours, and then the alcohol is to be poured off, and the insoluble portion set aside. By carefully distilling the alcohol, an oil rich in butyrine is left, but as it is slightly acid it is to be treated with carbonate of magnesia: the butyrate of magnesia thus formed being very soluble in water, is readily separated; the remaining fatty matter is then to be treated with alcohol, and this being distilled the butyrine is left pure.

The properties of butyrine are, that at 66° it is very fluid, and it congeals at about 32°. Its smell resembles that of heated butter. It is generally yellowish, but this colour is not essential, for some kinds of butter yield it almost colourless. Its specific gravity is 0·908; it is insoluble in water; but alcohol of specific gravity 0·822, when boiling, dissolves it in all proportions. When two parts of butyrine are combined with ten parts of boiling alcohol, the mixture on cooling becomes turbid; but when twelve parts of butyrine are similarly treated with the same quantity of alcohol, the mixture remains transparent even after it has become cold. During distillation the alcoholic solution becomes very slightly acid; and the residue contains traces of butyric acid. Butyrine readily saponifies, and is then converted into glycerine, and butyric, capric, caproic, margaric, and oleic acids.

BUXAR, a fortified town in the district of Shahabad, province of Bahar, situated on the right bank of the Ganges, in 25° 33′ N. lat. and 83° 57′ E. long., about 60 miles below the city of Benares. The fort is built on an eminence which projects into the river, the works are kept in good repair, and there is constantly an English garrison in it. The place is principally celebrated as the scene of one of those victories by which the British power in India was secured. The Mogul chiefs Suja ud Dowlah and Cossim Khan were encamped here with an army computed at 40,000 men, when, on the 23rd October, 1764, they were attacked and completely routed by 856 European and 6215 native troops under Major (afterwards Sir Hector) Munro.

Upwards of 2000 of the Mogul troops fell in the battle, and many more were drowned in their flight across a bridge of boats thrown over the Ganges. The force of Suja ul Dowlah, who was then the only Mogul chief possessing any considerable power, being thus destroyed, the emperor was thrown into the power of the English, and on the day following the battle applied to Major Munro for protection. (Mill's *Hist. of British India.*)

BU'XINA, a vegetable alkali obtained from the box-tree (*Buxus sempervirens*). It is difficult to procure this substance colourless; and it has generally the appearance of a translucid deep brown-coloured mass. Its taste is bitter, it excites sneezing, and is insoluble in water, but is dissolved in small quantity by alcohol and æther. It acts as other alkalies on reddened litmus paper, and forms neutral salts with the acids, which are more bitter than the base itself; and the solutions give gelatinous white precipitates with potash. Sulphate of buxina crystallizes confusedly. This alkali is contained in every part of the box-tree, and the bark gives nearly one per cent. of it.

BUXTON, a market town and chapelry, in the parish of Bakewell, and in the county of Derby, with 1211 inhabitants, is situated in that part of Derbyshire called the High Peak, in the hundred of High Peak, on the high road from Derby to Manchester, 33 miles N.W. from Derby, 20 miles S. from Manchester, 22 miles N.W. from Matlock, and 159 miles N.W. by N. from London. Its baths have been celebrated from the time of the Romans.

The town is situated in a deep valley or basin, surrounded by bleak hills and extensive tracts of moorland. It would be entirely environed with mountains but for the narrow ravine down which the river Wye flows on its way to the Derwent, parallel with the high road which leads to Bakewell. *Axe Edge*, on the Leek road, 3 miles from Buxton, is, next to *Kinder-scout*, the highest mountain in the N.W. of Derbyshire, being 1000 feet above the valley in which Buxton Crescent stands, and 2100 feet higher than the town of Derby. From this mountain four rivers issue in opposite directions—the Wye, the Dove, the Goyte, and the Dean. *Chee Tor*, a perpendicular and stupendous rock of limestone, 360 feet high, is situated near the village of Wormhill, and about 5 miles from Buxton. A few miles farther is *Mam Tor*, 1300 feet above the valley in which it stands; and a little E., the still higher peaks of Win hill and Losehill, which may be distinguished by their form from all the mountains in the county. The sterility which once formed the chief feature in the scenery round Buxton is fast disappearing. Extensive woods and plantations now clothe the sides and summits of many of the neighbouring hills.

Buxton consists of two parts, the old and the new town. The former stands upon much higher ground than the latter, and has still the remains of a cross in the centre of the market-place. The main street is wide, and contains a few good inns and lodging-houses, but the buildings in general are old and low. This was formerly the only entrance from the W. into Buxton, until a new road was made a few years ago, which avoids the old town and joins the London road at the church. The new part of the town may be said to begin at the Crescent and to stretch along the Bakewell road, the buildings of which form a handsome entrance to the town on that side, and afford many pleasant residences to those who seek more privacy than can be had at the public hotels.

The Crescent at Buxton is in the form of a segment of a circle. The basement story is a rustic arcade, forming a piazza 7 feet wide within. Over the arches a balustrade runs along the whole building. Above the piers are Doric pilasters that support an ornamental architrave and cornice, which is terminated by another balustrade, in the centre of which, cut out of stone, are placed the arms of the Cavendish family. This extensive and elegant structure is three stories high, and contains 378 windows. It comprises two hotels, a library, an assembly-room 75 feet long, and a news-room, besides the baths and a few private residences. The stables, as complete and extensive as the Crescent itself, occupy a large site of ground on the hill behind the chief structure, but divided from it by the main road. They are built in a circular form, and have a covered ride 160 yards round. This immense pile of building was erected by the late duke of Devonshire, in 1781, at a cost of 120,000*l.* The stone employed in the foundations and inner walls was found near the spot; and the fine freestone, used in the front and sides of the building, was dug out of a quarry not a mile distant.

At the W. end of the Crescent, and nearly adjoining it is the old hall, the most antient building in the lower part of Buxton, having been erected in the reign of Elizabeth, by the earl of Shrewsbury, in whose custody Mary, queen of Scots, was placed. In one of her visits to Buxton, the queen occupied apartments in this building which are still shown as hers, on one of the windows of which are scratched the lines said to have been written by her on her departure.

Buxtona, quæ calidæ celebrabere nomine lymphæ,
 Forte mihi posthac non adeunda, vale.

'Buxton, farewell! no more [illegible]aps my feet
Thy famous tepid streams s[illegible] ever greet.'

This house was considerably enlarged in 1670, and though inferior to the more fashionable hotels in the Crescent, is preferred by many families on account of its having baths for both ladies and gentlemen fitted up within its walls. There are also warm and shower baths, besides a bath for the gratuitous use of the poor.

The public baths at Buxton are very numerous, and are fitted up with every attention to the convenience of the visiters. The common tepid baths all lie together at the W. end of the Crescent, forming a part of the lower story. Besides a public bath, around two sides of which are numerous dressing-rooms, there are two private baths for gentlemen, and the same number for ladies. At the opposite end of the Crescent, adjoining the piazzas, are two hot baths, and vapour and shower baths, all heated by steam, which are supplied from what is called Bingham's well. Most of these are lined with white marble, and the temperature of the hot baths is most accurately adjusted by an ingenious contrivance for the introduction of cold and hot water.

At the extreme end of the town, on the Macclesfield road, is a cold bath, said to be of the same temperature as the waters at Matlock (66° Fahrenheit).

The well at which the water is supplied to those who resort to it is in a small building, in the style of a Grecian temple, in front of the W. wing of the Crescent. In the centre of this tasteful building, called St. Ann's Well, is a white marble basin, into which the water issues from the spring. By the side of this basin is a double pump, from which either hot or cold water may be procured within a few inches of each other. The spring flows at the rate of 60 gallons a minute, the water being somewhat colder than the waters at Bath, but warmer than those of Matlock and Bristol.

Besides what is properly called the Buxton water, there is a chalybeate spring of a rough strong taste, issuing from a chalky stratum on the N. side of the river Wye, at the side of the turnpike-road behind the Crescent, over which a neat stone structure has been erected by the duke of Devonshire, to preserve it for the use of visiters. Mixed with the other, this water proves purgative.

The public walks at Buxton, of which there is great variety, are laid out with much taste, and ornamented with shrubs and plantations.

The environs of Buxton abound with natural curiosities and romantic scenery. The high perpendicular crags on the Bakewell road, bordering the valley of the Wye, make it the most interesting, as it is the most accessible of all the scenery in the immediate vicinity of Buxton. At the distance of about half a mile, in a different direction, are the limestone quarries and Pool's hole. The latter is a cavern of considerable dimensions in a limestone rock, contracted in its entrance, but spacious in the interior. Its roof and sides are covered with stalactites, one of which, more remarkable than the rest, about the middle of the cave, is called 'the flitch of bacon.' Here the cave again contracts, but beyond it becomes wide and lofty as far as a large massy column of stalagmite denominated 'the Queen of Scots' pillar,' from a tradition that she stopped at this point. The further end of the cavern, comprising about 100 yards, is not very accessible. The whole length is 560 yards. The sides of the mountain are partly occupied with dwellings, not built, but excavated out of the ashes which have been thrown here from the lime-kilns. A considerable quantity of lime is burnt here, and sent into distant parts by the Peak Forest railway, which is near. At a little distance from the mountain beneath which is Pool's hole, is a place called 'Diamond Hill,' from its furnishing specimens of quartz of an hexagonal shape, which are known by the name of Buxton diamonds, the whitest of which have the property of cutting glass. About 5 miles from Buxton, at Barmour Clough, by the side of the road leading to Castleton, is an intermittent spring, called 'the ebbing and flowing well.' The water issues in different quantities, and at irregular intervals, out of several openings by the side of a small pool or basin. In dry seasons several weeks elapse without any flow into the well; whilst at other times the water flows once in twelve hours, sometimes every hour, and occasionally three times in an hour. A gurgling noise is heard when it flows, which continues for 4½ minutes. In the space of one minute 23 hogsheads have been discharged. This curious phenomenon is supposed to be occasioned by there being a reservoir of water in the hill above, from the lower part of which a duct rises to some height, but not so high as the reservoir, and afterwards descending to the well at the foot of the hill, acts on the principle of the siphon.

The rocks about Buxton consist of beds of limestone and of lava or toadstone, which lie alternately one upon the other. In many parts of the county there are three beds of each, which are many yards thick. There are many shops in the place for the sale of the mineral productions of the Peak, manufactured into various articles of ornament and use, besides fossils and specimens of natural curiosities. Among these is a beautiful spar, denominated 'Blue John,' formerly used in repairing the roads, but now worked into the most elegant vases, and purchased at the expense of forty guineas a ton. This spar is found near the Shivering Mountain, in the neighbourhood of Castleton

The church in Buxton is an elegant modern edifice, built in 1812 by the duke of Devonshire, its patron, adjoining to which is a large burial-ground. The living is a perpetual curacy in the diocese of Lichfield. The building formerly used as a church is now converted into a school upon Dr. Bell's plan, having endowments which amount to 94*l*. per annum. There are places of worship in Buxton for Presbyterians, Independents, and Wesleyan Methodists.

The market is held on Saturday; and the fairs on Feb. 3rd, April 1st, and May 2nd, besides a cattle-fair on the 8th of Sept. The town is in the honour of Tutbury, duchy of Lancaster, and within the jurisdiction of a court held at Tutbury every third Tuesday, for the recovery of debts under 40 shillings.

The number of visitors at Buxton varies from 12,000 to 14,000 annually. There are accommodations for 1500 at one time. The season commences in June, and ends in October.

BUXTON WATERS. The waters of Buxton belong to the northern or Derbyshire thermal springs, which have a lower temperature than those of the southern or Gloucestershire and Somersetshire group, except Bristol. They are of the calcareous class of mineral waters, and rise in a valley situated on the west edge of the great limestone range, which extends through the county of Derby from Castleton southwards, comprising what is termed the Peak Forest. The surface of this district is occupied, according to Farey, by the outcrop of four strata of limestone and three beds of amygdaloid or toadstone, interposed between the limestone strata; but it should be observed that this division of the limestone by regular beds of toadstone, has been stoutly denied and at present is not generally received. Above the upper stratum of limestone is a coarse sandstone or millstone grit, considered by many as the inferior bed of the coal formation, which occupies the whole country E. and N. of this district. Buxton is immediately to the S. of the outgoing of the lowest stratum of limestone. The limestone, which is of a whitish or yellowish colour, is full of encrinites, madrepores, and other organic remains. The direction of the strata is generally N. and S. A remarkable fault is observed in the valley of the Derwent at Matlock: the upper bed of limestone on the western side of the valley is brought down below the second bed on the E., and the upper bed of toadstone on the one side is nearly on the same level with the second bed on the other. The fault is said to extend N. as far as Buxton, where it takes a N.W. direction to North Bradwell, and terminates at Litton near Tideswell; but both the direction and extent of this fault have been much disputed. It is in the course of this fault that the thermal springs of Buxton and Matlock are found. That of Buxton possesses the higher temperature, viz. 82° Fahr., which never varies at any hour of the day or season of the year. This water has been long celebrated for its medicinal virtues. It is more remarkable for the nature of its gaseous impregnations than for the quantity or nature of its saline ingredients. By a recent analysis it appears to contain only 15 grains of solid contents in each wine-gallon. According to Mr. Gairdner its composition is—

Of gaseous contents—	Cubic inches, per Gallon.
Carbonic acid	1·50
Nitrogen	4·64
	6·14
Of solid contents—	Grains, per Gallon.
Hydrochlorate of magnesia	·58
,, soda	2·40
Sulphate of lime	·60
Carbonate of lime	10·40
Extractive matter and vegetable fibres	·50
(Loss)	·52
	15·00

Owing to the quantity of calcareous matter, the water is hard. It sparkles a little when first received at the fount. It is exceedingly clear, and does not become turbid by long exposure to the air. Over the bath a stratum of vapour hovers, which is more or less dense according to the state of the weather and the degree of attention paid to the ventilation of the apartment. The chalybeate spring contains about half a grain of carbonate of iron in each gallon, and is a soft water.

The waters issuing from the warm spring are employed both internally and externally. A course of the water internally is generally taken at the same time as the baths are used; but in some habits of body the one mode only is admissible. Persons of the sanguineous temperament, especially if plethoric, can rarely take the waters internally, without at least previously undergoing some preparatory treatment,—either venesection, cupping, or the use of purgative medicines. During all acute inflammatory diseases they must be avoided; and though very beneficial to persons subject to gout and rheumatism, the waters must not be employed either when an attack of the disease is approaching, or while much pain of the joints remains when the disease is receding. Persons in whom the digestive organs are feeble, either naturally or from the effects of what is termed *good living*, derive, in general, much benefit from the internal use of these waters. In most cases they should be taken early in the morning, after the bath, if these two modes be employed simultaneously. The quantity to be used should not at first exceed half a pint, taken in two equal portions, a quarter of an hour (during which the invalid will walk along the terrace when practicable) being allowed to intervene between the two glasses. About noon the same quantity should be again taken, observing similar rules. Some patients are however obliged to restrict themselves to its use during the forenoon, omitting the morning dose. No one should exceed a pint and a half in the course of each day.

The chalybeate water is sometimes used at the same time, and it is said that a mixture of the two forms a purgative draught. Upon the propriety of using the chalybeate at any period during his stay, the invalid must consult his medical adviser on the spot. It ought never to be used as a common drink, more particularly by persons of a plethoric habit of body.

The warm baths may be employed even by the most delicate persons, provided bathing in any form be proper. At first the stay in the bath should not exceed one minute, as the plunge is the most beneficial part of the process. The time may be gradually extended, but should never exceed fifteen minutes. Where a general bath cannot be borne by gouty or rheumatic patients, pumping the water upon the affected joints is frequently highly efficacious in reducing the swelling and restoring flexibility. During the use of the baths no mercurial medicines of any kind should be taken, unless under the direction of a competent medical adviser on the spot. (Farey's *Derbyshire*; Gairdner *on Mineral Springs*; Denman, Saunders, Scudamore.)

BUXTON, JEDEDIAH, was born at Elmton, near Chesterfield, about the year 1705. His grandfather had been clergyman of the parish, and his father was schoolmaster of the same place; but Jedediah was so illiterate that he could not even write, and his mental faculties, with one exception, were of a low order. He possessed, however remarkable facility in performing arithmetical calculations; and when he fairly understood a problem, which it was not easy for him to do if it was a little complicated, he solved it with wonderful rapidity. He was altogether incapable of looking into the relations of things, except with respect to the number of parts of which they were composed. After hearing a sermon he knew nothing more of it than that it contained a certain number of words, which he had counted during its delivery. If a period of time were mentioned he began calculating the number of minutes which it included; and if the size of any object were described, he would at once compute how many hair's-breadths it contained. His ideas were comparatively childish; and his mind was only stored with a few constants which facilitated his calculations; such as the number of minutes in a year, and of hair's-breadths in a mile. His system of mental arithmetic was not founded upon any sound principles; in fact he could scarcely be said to have a system. He would, for instance, in order to ascertain the product of 478 multiplied by 100, proceed first to multiply it by 5 and then by 20, instead of at once adding a couple of ciphers.

His condition in life appears to have been either that of a small land-owner or a day-labourer; but probably the former. Having a strong desire to see the king, he walked up to London to gratify this wish; but from some circumstance or other he did not see him. During his stay in the metropolis Jedediah was seen by several members of the Royal Society, who examined him. He was taken to see Garrick in Richard III., and during the performance occupied himself in counting the number of words which each of the actors made use of; the quantity of steps in a dance; but he acknowledged that the instrumental music, with its complication and variety of sounds, baffled his skill. In June, 1754, a portrait of Buxton appeared in the 'Gentleman's Magazine,' with a short account of his life, which is probably the most authentic of any of the notices which have been published concerning him. He is represented in the print as being in his 49th year. Glover, in his 'History of Derbyshire,' states that he was born in 1707, but is unable to give the exact time of his death, which however occurred between 1770 and 1780. He was married, and had a family.

BUXTORF, a family celebrated for its attainments in Hebrew literature. JOHN BUXTORF was born on Christmas-day, 1564, at Camen in Westphalia, of which place his father was Calvinist minister. He was educated at Marburg and Herborn, under Piscator, and afterwards received instructions at Bâle and Geneva from Grynæus and Theodore Beza. He occupied the Hebrew chair at Bâle for 38 years of his life, and so attached was he to that University, that he declined many advantageous offers of a similar occupation both at Saumur and at Leyden. Besides maintaining a large correspondence with all who were skilled in the leading object of his research, he lodged and supported in his house many learned Jews, with whom he familiarly conversed, during his leisure hours, respecting their language. He died, September 13th, 1629, after having published, besides many separate tracts, more than one 'Grammar' and 'Lexicon' of the Hebrew and Chaldee tongues, a 'Concordance,' and a 'Hebrew Bible' with the notes of the Rabbins.

JOHN, son of the preceding, was born at Bâle, August 13th, 1599, and exhibited precocity so remarkable, that in his fourth year it is said that he understood German, Latin, and Hebrew; a statement doubtless greatly exaggerated. After cultivating Hebrew, in France, Germany, and Italy, he succeeded his father at Bâle, 1630, where he died, August 16th, 1664. Besides collecting, augmenting, and editing many of his father's works, he was the author of several original treatises on Hebrew literature.

JOHN JAMES, son of the preceding, like his father and grandfather, was professor of Hebrew at Bâle, where he was born September 4th, 1645, and died April 1st, 1704. He travelled in Holland, France, and England, and was received every where with honour, especially at Cambridge. He printed nothing in his lifetime but a preface to his grandfather's work entitled 'Tiberias,' which is an historical and critical vindication of the Masorethic points, the origin of which he assigns to Esdras. But he left behind him many MSS. connected with Rabbinical literature. Another JOHN, nephew to the above, was also professor of the Oriental languages at Bâle, and died in 1732, leaving a son to distinguish himself by similar learning.

The works of the Buxtorfs greatly advanced the progress of Hebrew literature, and the depth of their learning has never been disputed. By the Romanists in general they have been esteemed too much addicted to Rabbinical fancies, and in the controversy respecting the Hebrew points, their espousal of them has been a frequent object of attack.

Of the elder Buxtorf, however, scholars, such as Vossius and Casaubon, spoke with the highest encomium, and Joseph Scaliger expressed himself thus—that he ought to be sidered the master of the Rabbins, that he was the only man who understood the Hebrew language thoroughly, and that, notwithstanding his own grey beard, he would gladly become his scholar.

BUXUS, the genus of plants whose species afford the valuable hard wood called Box. It is remarkable botanically as being the most northern arborescent plant of the natural order Euphorbiaceæ, all the other trees of which are confined to mild or tropical climates. Its essential character is to have both the male and female flowers upon the same individual; a three or four-parted calyx; in the *males* a two-lobed scale and four stamens placed round the rudiment of an ovary; in the *females* three small scales, three styles, three blunt stigmas, and a three-horned, three-celled, six-seeded capsular fruit.

The only two certain species are *B. sempervirens* and *B. Balearica*. The former or common box forms a large evergreen bush or small tree, common all over the south of Europe, from Spain to Constantinople, and reaching even so far as the north of Persia. In this country it is only found on warm chalky hills. Many varieties are known in gardens, the most remarkable of which is the dwarf-box, so much used for the edgings of walks. Between this and the arborescent form the difference is so great, that one wonders how they can be both the same species, and Miller and others have even considered them distinct. But De Candolle states, that the wild plant in France is very variable in size, rising in some places to the height of 15 or 20 feet, and in rocky localities not exceeding 3 feet. It is from the arborescent *Buxus sempervirens* that box-wood is obtained. For the turner, for mathematical instruments, and especially for the uses of the wood-engraver, it is invaluable. The French employ it for coat-buttons, &c. 'The value of the box-wood sent from Spain to Paris is reported to amount to about 10,000 francs a-year. In 1815 the box-trees cut down on Boxhill, near Dorking in Surrey, produced upwards of 10,000*l*.' (Macculloch, *Dict. of Com.*) Great quantities are imported from Turkey, and of fine quality. This wood sells in the London market for from 7*l*. to 14*l*. a ton, the duty of 5*l*. a ton included. The leaves have been employed, medicinally, as a tonic, a substitute for Peruvian bark.

Buxus Balearica, the Majorca box, is a handsomer plant than the other, with broader leaves, and a more rapid growth; but it is much more impatient of cold. Plants of it however live in the neighbourhood of London without protection. It is found wild in the neighbourhood of Lluch in Majorca, on the hills, at the height of 1500 feet; and it also occurs abundantly on Mount Galatzo, where it is mingled with the palmetto, but not in great masses. (Cambessèdes.) We find nothing in books concerning the quality of its wood; but there is reason to suppose that a part at least of the Spanish and Turkey box-wood is furnished by this species.

BUZZARD. [FALCONIDÆ.]

BUZZARD'S BAY, a bay on the south coast of the State of Massachusetts, U. S. The peninsula of Barnstaple projects in the form of a boot, the point of which, at Cape Cod, is curved like a ram's horn; Buzzard's Bay forms what may be termed the top or opening of the boot. The neck of land which connects the peninsula with the rest of Massachusetts, between Cape Cod Bay and the head of Buzzard's Bay, is only about four miles in breadth. This bay was entirely frozen over early in February, 1836, a circumstance which has not happened for many years. In the harbour the ice was from eight to twelve inches thick. The parallel of about 41° 35′, and the meridian of 71° 15′ W., intersect each other in Buzzard's Bay.

BYBLUS, an antient town of Phœnicia, now called Jobail, and situated nearly half way between Tripoli and Beirout, by the sea-coast, and at the foot of a mountain which is one of the lower range of Libanus. 'The town is enclosed by a wall, some parts of which appear to be of the time of the crusaders. There is a small castle, in which the Emir Beshir or prince of the Druses keeps about forty men.

(Burckhardt's *Travels in Syria*, 1812.) The celebrated Jewish writer Philo was a native of Byblus. This place was once famous for the temple of Adonis. (Maundrell, *Journey from Aleppo to Jerusalem.*)

[Coin of Byblos.] Brit. Mus. Copper. 150 gr.]

BYLAW. Bylaws are the private regulations of a society or corporation, agreed upon by the major part of its members, for purposes of self-government, or for more conveniently carrying into effect the object of its institution.

It is not every voluntary association to which the law of England gives the power of binding dissentient members by the enactments of the majority. Immemorial custom or prescription, or legal incorporation by the king, or some positive act of parliament, is necessary to confer this power of local or private legislation; and even in those cases the superior courts of law exercise the right of discussing the validity or policy of the bylaw, and of establishing its legality or declaring it to be void. In order to stand this test it must be reasonable and agreeable to the general policy of the law of England, and must not attempt to bind strangers unconnected with the society, or to impose a pecuniary charge without a fair equivalent, or to create a monopoly, or to subject the freedom of trade to undue restraint. The general object of a bylaw is rather to regulate existing rights than to introduce new ones or to extinguish or restrain the old.

The power of making bylaws is not absolutely confined to corporate bodies. It is in some instances lawfully exercised by a class of persons having no strict corporate character. Thus the tenants of a manor, the jury of a court-leet, the inhabitants of a town, village, or other district, frequently enjoy a limited legislative power of this kind, either by special custom or common usage. But in general the power is exercised only by bodies regularly incorporated, and in such bodies the power is inherent of common right without any specific provision for that purpose in the charter of their incorporation. The expediency of this power is so obvious that we cannot be surprised at meeting with proofs of its existence in all countries and at a very early date. The Roman code recognized a right among the confraternity of its corporations to bind one another by similar engagements, as long as they were not at variance with the public law (*Digest*, lib. xlvii tit. 22), and professes to borrow this provision from the still more ancient code of Solon.

Our own term *bylaw* is of Saxon origin, and is formed by prefixing to the word *law* another word *by* or *bye*, which means *house* or *town*. Hence its primary import is a *town-law*, and in this form and with this meaning it is said to be found among the antient Goths, the Swedes, the Danes, and other nations of Teutonic descent. (Cowel, voc. *Bilaws*; Spelman on *Feuds*, chap. ii., and the Glossaries under the head *Bilago*, or *Bellago*.)

The *birlaws* and *birlaw courts* of Scotland, mentioned by some of the jurists of that country, are said to present some analogies to our bylaws, and may perhaps be referred to the same origin.

The late act for the regulation of municipal corporations gives to the town councils a power of making bylaws for the good rule and government of the boroughs, and for the suppression of various nuisances; and of enforcing the observance of them by fines limited to 5*l*. It directs however that no bylaws so framed shall come into operation until they have been submitted to the privy council for his majesty's approval—a precaution resembling in some degree the provisions of the Statute 19 Hen. VII., c. 7, by which the ordinances of trading guilds were made subject to the approbation of the chancellor, treasurer, chief justices, or directres of assize.

It is in the COURGE, eldest son of John Byng of Wrotham
of Buxton and Mattoeuladelphia, daughter of Mr. Johnson of
sesses the higher temperature, 1663. He entered as a vo-
varies at any hour of the day ears of age. From 1681 to
This water has been long celein the land service with the garrison of Tangiers, where he received promotion, first as ensign, afterwards as lieutenant. In the following year, while acting as lieutenant on board the Phœnix in the East Indies, he was desperately wounded in a gallant action with a Zinganese pirate, whose vessel he boarded and sent to the bottom, himself being picked up out of the sea with difficulty as she went down. In 1688 he was particularly active in attaching the fleet to the interests of the Prince of Orange, and he afterwards served with distinction under Sir G. Rooke and Admiral Russell. He commanded a third-rate in the successful expedition to Vigo in 1702, was made rear-admiral of the red in the year following, and received the honour of knighthood after the battle of Malaga in 1704. In 1706 he was commissioned vice-admiral of the red, and returned member of parliament for Plymouth, which borough he represented till he was created a peer in 1721.

His continued and important services had already obtained for him the dignity of baronet in 1715. In 1718 he totally defeated a Spanish fleet off Messina, and he was finally rewarded with some of the highest professional honours, as Rear-Admiral of England, and Treasurer of the Navy: he was also made a Member of the Privy Council, Baron Byng of Southhill in the county of Bedford, Viscount Torrington in Devonshire, Knight of the Bath, and First Lord of the Admiralty, in which exalted station he died January 17, 1732-3.

BYNG, JOHN, fourth son of the preceding, by Mary, daughter of James Master of East Langdon, in the county of Kent, Esq., was born in 1704, and entered early into his father's profession, in which he made the usual progress through subordinate stations. In 1756 he was appointed to command a squadron of ten ships of the line in the Mediterranean, destined for the relief of Minorca, at that time menaced by the French, and hoisted his flag accordingly on board the Ramilies. His equipments were by no means adequate to the service required, and on touching at Gibraltar to take in provisions and to refit, he learned that not less than twelve sail of the line, numerous frigates, and a large flotilla of transports from Toulon, had already landed 19,000 men in Minorca, and that the whole of the island, excepting Fort St. Philippe, was reduced. A council of war declared, on the unanimous authority of officers well acquainted with the island, that relief under these circumstances was impossible. Nevertheless Byng proceeded, and made an unsuccessful attempt to establish a communication with the garrison by his frigates. An engagement with the French squadron, under the Marquis de la Galissonière, ensued, and the fleets separated after an indecisive action, in which Byng took little part. The clamour raised at home was more directed against the ministry, who had neglected to fit out the fleet properly, than against the admiral, who had fought languidly; and the cabinet weakly and wickedly resolved to sacrifice Byng in the hope of securing their own reputation. They were assisted in this design by his professional unpopularity: his habits were austere; he was a rigid disciplinarian; and he had no brilliant former service to urge in his favour. He was accordingly superseded, and brought to a court-martial. It appeared from the evidence that he had not been anxious to engage; but ample testimony was borne to his courage. In his defence he inveighed against the policy of the enterprise, showed the little chance of victory which the crippled state of his ships permitted him to entertain, and the calamitous results which *must* have followed defeat. After a long trial he was found guilty of not having done his utmost, sentenced to be shot, but unanimously recommended as a proper object of mercy. The intrigues of his political enemies however prevailed: the press was employed against him; and Mallet, an able but venal writer, led the van; and in spite of many representations in his favour, the sentence was executed at Portsmouth on March 17, 1757. Byng met his fate with calmness and fortitude, and posterity has done ample justice to his memory.

BYNKERSHOEK, CORNELIUS VAN, was born at Middelburg in Zealand, on the 29th of May, 1673. His father, who was a merchant, paid great attention to his education. He was sent, when about seventeen years of age, to the University of Franeker, at that time a seat of learning of considerable reputation, where, after two years' study, he began to apply himself sedulously to jurisprudence, and in the course of the two following years wrote three disputations, which gained him great credit by the erudition and judgment displayed in them. From this we may infer that the tone and character of his mind were early formed, as the qualities of which he then gave promise were those which peculiarly distinguished him in after-life, and on which his reputation mainly rests. After taking the degree of Doctor in the year 1694, he went to practise as an advocate at the Hague, where was held the supreme court of justice for the provinces of Holland, Zealand, and West Friesland.

In the year 1699 he is said to have edited a Dutch journal, which was soon suppressed as being too satirical. At all events it seems to have caused little interruption to his severer occupations, for in the writings which he has left behind him we find ample evidence of the zeal and industry with which he devoted himself, through the whole of a long and laborious life, to the study of jurisprudence.

In the year 1703 he was elected by the states-general a member of the Supreme Court. As such he was called upon to administer the common law of his own country, which, as he describes it, besides being grossly defective, was vague, uncertain, and obscure; so that frequently the further an investigation was carried, the greater was the perplexity it led to.

Where the law of Holland failed, his colleagues on the bench, afraid of shackling themselves with the technicalities of the Roman law, ran into the opposite extreme, and professing to be guided by the light of natural equity, soon lost themselves in a maze of uncertainty. Bynkershoek saw and pointed out the necessity of having some fixed standard to appeal to. He had always admired the Roman law for its manly simplicity, and valued it highly as furnishing the soundest principles of legal decision. Having now a practical object in view, he pursued his studies with greater ardour. About the year 1710 he published his first work of any great importance, the 'Observationes Juris Romani,' consisting, as its title imports, of a collection of detached dissertations and criticisms.

Neither in this nor in any of his subsequent works does he aim at being a systematic writer. He did not study the Roman law merely in its aggregate form, as it stands in the compilations of Justinian; he rather sought to become acquainted with it more thoroughly, by investigating its origin, tracing its progress, and making himself familiar with its character. Accordingly, he does not confine his attention to points of practical importance only, but examines with unwearied research, and in a spirit of bold yet judicious criticism, subjects of every kind, setting former interpreters right where they were mistaken, and leading the way where they were at fault.

In the year 1719 appeared under the title of 'Opuscula varii Argumenti,' a collection of treatises, which he had written at different times. One of these, which he had before published in 1695, soon after his coming to the Hague, contained the substance of his three academical disputations.

On the 26th of May, 1724, he was appointed by the States General president of the supreme court: but the activity of his intellect was not slackened by promotion, nor confined to the practical duties of his office. He published in 1730 another collection of treatises, under the title of 'Opera Minora,' all of which had previously appeared separately at various times between 1697 and 1721.

In 1733 appeared four more books of 'Observationes Juris Romani,' written in continuation of the former work of the same name, which he had published more than twenty-two years before. About the same time he retired from the bench, of which he had been forty years a member. His retirement however was not a period of indolence. 'Having now more leisure than formerly, I will do my utmost,' he says, 'to render a good account of it to the world.' His labours were however henceforth turned into a different channel. He gave up the study of the Roman law, and applied himself for the last years of his life to the task of laying before the world the learning which in the course of his study and his practice he had acquired on two very important subjects—international law, and the law of his own country. On the former of these he had already written two treatises, which are printed among his 'Opera Minora.' The one, 'De Dominio Maris,' which originally appeared in 1702, as an appendix to another dissertation, has always been appealed to with respect on a difficult and still disputed question. The other, 'De foro Legatorum Competenti,' was first published in 1721, and was soon after translated into French by Barneyrac. In the year 1737 he produced a more important work, 'Quæstiones Juris Publici,' in two books; the first of which treats of war and peace, and the second is on miscellaneous subjects. The 'Quæstiones Juris Publici,' as well as the treatise 'De foro Legatorum,' though founded too exclusively on Dutch authorities, and written with too exclusive a reference to Dutch institutions, so that they appear to treat rather of the public law of Holland than of international law in general, have nevertheless been regarded by the publicists of all nations as works of the highest authority and most universal application.

The next and last labour undertaken by Bynkershoek was on the laws of his own country,—'Quæstiones Juris Privati.' He did not live to complete the work, but as much of it as was prepared for publication at the time of his death appeared soon afterwards, under the superintendence of an anonymous editor, supposed to be his son-in-law, W. Pauw.

Besides his published works, Bynkershoek had employed himself during the whole of his professional life in the execution of two very laborious undertakings. One of these, which he called 'Observationes Tumultuariæ,' consisted of notes which he had taken of the decisions and proceedings of the supreme court. The other, a work of still greater interest and importance, was a collection of all the scattered laws of his own country, whether existing in the enactments of the several legislative powers which had successively prevailed there;—in the decisions of the courts, the practice of the bar, or the customs and statutes of particular cities and districts. This immense mass he had digested, so as to form a complete 'Corpus Juris Hollandici et Zelandici.' These two collections were intended solely for his own use; and he gave express orders in his will that they should never be published. It is to be regretted that his will should have been so religiously obeyed. The latter work, in particular, must have contained a history of the jurisprudence of Holland during the middle ages, which in the hands of Bynkershoek would hardly fail to throw much light on the extent to which the Roman law prevailed, and the influence which it had on the institutions and customs of the Teutonic races.

Bynkershoek had long suffered from asthma; to this, at last, was added dropsy on the chest, of which he died on the 16th of April, 1743. He was twice married; and by his first wife left six daughters A complete edition of his works was published at Geneva, in 1761, in folio, by Vicat, professor of law at Lausanne: and another in two volumes folio, at Leyden, in 1766.

BYRON, LORD GEORGE GORDON, was born on the 22nd of January, 1788, in Holles Street, Cavendish Square, London. His descent dates from the time of the Norman conquest of this island. The Byrons, or Birons, who had been knights and baronets long before, were first made lords during the reign of Charles I., whose cause they espoused in opposition to that of the Commons of England. Notwithstanding his antient lineage, of which he was always proud, Byron, owing to the imprudence and vices of his father (Captain Byron, nephew to the then lord), was born and brought up in what, considering the notions of his class, must be called poverty. Owing to an accident attending his birth, one of his feet was distorted, a defect which was a source of pain and mortification to him during the whole of his life.

In 1790, when he was only two years old, his mother, who had separated from her husband, retired with her child to Scotland, her native country, and established herself in humble lodgings in the town of Aberdeen. Proud, impetuous, and of a most inflammable temper, this unfortunate woman was not at all fitted to correct those hereditary vices which Byron in after years was accustomed to say were strong within him. The most important of all the parts of education is that for which the child stands indebted to its mother, and nothing could well be worse than the poet's maternal tuition and example. As for his father he took no charge of him, but withdrawing to the continent, in order to escape his creditors, he died at Valenciennes in 1791. When about five years old, Byron was sent to a day-school at Aberdeen, kept by one Bowers, who received from the poet's mother five shillings a quarter for such instruction as he could give. After staying rather more than a year at this school, he was placed under the tuition of a poor but well-informed Scotch clergyman, called Ross, who taught him to read. From the care of Mr. Ross his mother removed him to that of Mr. Paterson, the son of his shoemaker, who taught him a little Latin, and attended to him with much kindness, until Mrs. Byron sent him to the free grammar-school of Aberdeen, where he was studying when the death of the lord, his grand-uncle, recalled him to England, and to the enjoyment of such a provision as suited a peer of the realm in his minority. This uncle, to whom he succeeded, was a man of turbulent passions, and a melancholy occurrence had thrown a gloom over the last thirty years of his life. In a duel, which some people say was rather a chance scuffle arising out of the heat and intoxication of the moment, he killed his neighbour and relative Mr. Chaworth. The House of Peers, before whom he stood his trial in 1765, acquitted him, but his own conscience and his country neighbours never did. He shut himself up in his patrimonial mansion, the old and then melancholy Abbey of Newstead in Nottinghamshire, and thenceforward led an unsocial and eccentric course of life. He took no interest in his heir, who was destined to illustrate the proud name of Byron; he never seems to have exercised any pecuniary generosity towards him, and it is said that, on the rare occasions when he mentioned him, it was always as 'the little boy who lives at Aberdeen.' In 1798, when the poet succeeded to his uncle's titles and estates, he was little more than ten years old. His mother, whose weak head was turned by the sudden change in her fortunes, immediately removed to Newstead Abbey, and took great pains to keep always before his eyes the fact, that, though only a boy, he was now a lord. To attend both to body and mind, she employed one Lavender to straighten his unfortunate foot, and a Mr. Rogers to instruct him in Latin. The former, who was an impudent quack, did him no good; but the latter, a respectable schoolmaster of Nottingham, improved him considerably by reading passages from Virgil and Cicero with him. In less than a year Byron's mother carried him to London, whence, after consulting more able surgeons, who could no more cure a deformity than the empiric had been able to do, she had him conveyed to Dulwich and placed in a quiet boarding-school, under the direction of the late Dr. Glennie. But for the indiscretions and constant interference of Mrs. Byron, Dr. Glennie might not only have made him a better scholar than he ever became, but have checked in the germ at least some of those infirmities of temper and those vices which embittered his after-years. He had not been two years under charge of this excellent man, when his mother removed him to Harrow, where, with the exception of the usual long vacations, he remained till 1805, when he was sent to Cambridge. During his stay at Harrow he was irregular and somewhat turbulent in his habits; but he frequently gave signs of a frank, noble, and generous spirit, which endeared him to his school-mates: he had no aptitude for merely verbal scholarship; his patience seems to have failed him in the study of Greek, but this might be the fault of the system under which he was taught. He however read a great deal, and by occasional fits of application laid in some store of miscellaneous knowledge. During his vacations his mother continued to spoil him by alternate fits of harshness and indulgence. She introduced him to masquerades, and other scenes of excitement and fashionable follies, before he was fifteen years old. It was at about this period of his life that he became acquainted with Miss Chaworth, the heiress of Annesley and descendant of the Mr. Chaworth whom his lordship's great-uncle had killed. We have no doubt that this very circumstance had a great effect on his excitable and romantic imagination. In one of his memorandum-books he wrote, 'Our union would have healed feuds in which blood had been shed by our fathers; it would have joined lands broad and rich; it would have joined at least *one* heart, and two persons not ill matched in years—she was two years my elder.' His lordship had fancied himself in love two or three times before, but this more than half-imaginary passion for Mary Chaworth seems to have haunted him almost to the last hours of his existence, and he always persisted in saying, that had he been united to her he should have proved a better and a happier man. The young lady treated him as a clever, warm-hearted, but capricious school-boy, a friend and nothing more, and a year or two after her first acquaintance with the poet she gave her hand to Mr. John Musters, a gentleman of Notts. But all Byron's Harrow vacations were not spent in making love: he passed one of them in the house of the Abbé Rouffigny, in Took's Court, for the purpose of studying the French language; but he spent most of his time in boxing and fencing, to the no small disturbance of the old Abbé's establishment.

In October, 1805, he went to Trinity College, Cambridge, where he spent two years in the way that is not uncommon with young men of rank and fashion; but still, by fits and starts, he devoted himself to pretty hard study, and continued to cultivate that taste for poetry which first showed itself when he was about ten years old, and which he had never since permitted to lie wholly dormant. At the same time he indulged in many eccentricities, and caused great annoyance by keeping a bear, and several bull-dogs. But at Cambridge, as at Harrow, he frequently evinced the most generous and noble feelings, and chose his associates, with one or two exceptions, from among the young men of the greatest ability, wit, and character, to a few of whom he seems to have continued much attached in after-life. In 1806, while yet at college, he printed a very thin quarto volume of poems for private circulation. Of this edition Mr. Moore says there are but two or at the most three copies in existence. In 1807 he brought out, in one vol. 8vo., his 'Hours of Idleness,' which were very severely, but we cannot say altogether unjustly, handled in the Edinburgh Review. It was just such a collection of fugitive pieces as any tolerably read young man of nineteen might write: it was not less, and it certainly was not more, than this. In this volume we can scarcely discover any indication of the superior genius which he afterwards displayed; and there was in it an assumption of aristocratic airs that rendered the author peculiarly obnoxious to writers who advocated liberal principles. The severity of the reviewers seems to have produced a good effect on his lordship's muse, which was always too readily animated and inspired by feelings of spite and revenge. He collected his [illegible] brought them to bear on one point, he took more pains with his style, and in 1809 brought out his well-known satire, 'English Bards and Scotch Reviewers,' which, however faulty in parts as a composition, and blameable in moral feeling, was a wonderful improvement on his preceding productions. A few days before the publication of this satire he took his oath and seat in the House of Lords. He always complained bitterly that, on this trying occasion, young, inexperienced as he was, he was left to face the House alone—that none of his noble relations or connexions were there either to introduce him or receive him—that never was youth of his rank left in a state more lone and unfriended.

At one time Byron thought seriously of devoting himself to politics, and wrote to his mother that he 'must do something in the House soon.' He delivered two set speeches in the Lords, with indifferent success and a tolerable ignorance of the subjects on which he spoke, and then his senatorial ardour ceased altogether. This was after his return from his travels, in 1812.

On the 2nd of July, 1809, Lord Byron, in company with his friend Mr. John Cam Hobhouse, left England to travel in Portugal, Spain, Greece, Turkey, &c. He was absent two years on this classical tour, which enriched his mind with incidents and poetical imagery, and filled it with reflections of some of the finest and most melancholy scenery in the world. His travels, in fact, finished his poetical education, and nearly everything he wrote afterwards is redolent of the glowing atmosphere of the East, and bears more or less directly on the adventurous, impassioned narratives which he heard in 'the clime of the East,' in the land of the sun.'

In March, 1812, Byron published the two first cantos of his splendid poem 'Childe Harold,' which at once gained him the very highest name among the poets of the day. The popularity of this production was as immediate as it was great, and he used to say, he went to bed one night, and, on waking the next morning, found himself *famous*. He was now sought after by the rich and great, who formerly knew him not, or avoided him; and he threw himself into the vortex of fashionable dissipation without much taste for its pleasure, and with little respect for the mass of those with whom he associated.

To pass over some minor productions, it was in the month of May, 1813, that his wild oriental tale, or rather fragment of a tale, 'The Giaour,' first appeared; this was followed, in December of the same year, by the 'Bride of Abydos,' another passionate Eastern poem, more consecutive as a narrative than the Giaour, [illegible] ally rich in scenic descriptions. In January, 1814, he published his 'Corsair,' one of the most applauded, [illegible] in our opinion far from being one of the best of his productions. He, however, showed in it an admirable mastery of the ten-syllable English verse and what he called 'the good old and now neglected heroic couplet.' His descriptions of the Islands and the scenery of the coast of Greece are [illegible]quisitely beautiful: they are moreover correct pictures, [illegible] must be felt by all who have travelled in those climes. [illegible] story, like all his stories, is badly constructed: the characters are not very dramatically sustained, and have little in them to lay hold of the heart when the fervour and passions of youth are passed. It is stated on the best authority that 14,000 copies of the Corsair were sold in one day. In May, 1814, he published his splendid ode on the first fall of Bonaparte. In August of the same year appeared his 'Lara,' an irregular sort of sequel and wind-up to the 'Corsair,' written in much the same style, but with rather less power. During the blaze of his poetical fame, and his intoxicating success in society, Byron was hardly ever happy, and he occasionally withdrew for considerable periods to the solitude of the old abbey at Newstead. In October, 1814, he was married to Miss Milbanke, a great heiress in prospect, but at the time possessed of little money, while the poet stood in need of a great deal. He was in fact so involved in his pecuniary affairs, that he tells us he had nine executions in his house during the first twelve months of his marriage, besides having his door continually beset by duns. These were not circumstances likely to soothe the irritable temperament of Lord Byron: he sought a refuge from them in pleasures from home; and an utter incompatibility of character between him and his lady becoming every day more and more conspicuous, augured ill for this hastily-formed alliance. On the 10th of December, 1815, Lady Byron bore him a daughter, the Ada of his poems (now Lady King); and in the latter end of January she left his house with her infant, and retired to her father's residence in Leicestershire: the poet never saw his wife or child again.

At the end of February, 1815, he published his two poems, the 'Siege of Corinth' and 'Parisina.' On the 25th of April following, he set sail for Ostend, with a fixed determination never more to return to a country which had given him honours, titles, competent wealth, and fame.

On starting on his continental travels, he went through Belgium, up the Rhine, and then through part of Switzerland to Geneva, where he fixed himself for some time, his favourite companions there being the late Mr. Shelley, the poet, and Mrs. Shelley. He often crossed the lake to visit Madame de Staël at Coppet. His frequent voyages on the lake of Geneva, and excursions among the Alps, revived all his passionate adoration of sublime scenery. During his stay at the villa Diodati, near Geneva, he wrote the third canto of 'Childe Harold,' the 'Prisoner of Chillon,' 'The Dream,' and several of his fugitive pieces. In October, 1816, he left Switzerland for Italy, and by the middle of the following November, we find him at Venice, where he remained for more than three years, which were mainly spent in an alternation of literary labour and debauchery. We must, however, deduct from this long sojourn some three weeks, which he employed in visiting Rome in company with his friend Hobhouse, and a few excursions he made to Bologna and other places. In January, 1820, he took up his residence at Ravenna, where he involved himself with secret societies and Italian plots to overthrow the government of the pope. The brother and other near connexions of the Countess Guiccioli, a married woman to whom he had attached himself, were so seriously committed, that the papal government exiled them from the States of the Church. Upon this, the lady and her relatives took refuge in Tuscany, and ultimately fixed themselves at Pisa, whither Byron soon followed them in November, 1821.

Soon after his arrival at Pisa, he was joined by Mr. and Mrs. Shelley, and his party was subsequently increased by Mr. Leigh Hunt and family. Byron, Shelley, and Hunt started a work called 'The Liberal,' which was to appear periodically, and to be written and edited by the three conjointly. It was altogether a badly-devised scheme, and, after the irregular appearance of two or three numbers, the work stopped. In July, 1822, he was much affected by the death of his friend Shelley, who was drowned in a small pleasure-boat off the coast of Tuscany. In October he went to Genoa. Early in 1823 he received flattering overtures from the committee of friends to the Greeks established in London for the purpose of aiding that people in their struggle for independence. His knowledge of the country, the beauty and energy of the many verses in which he had described her sad condition under the Turks, naturally directed attention to his lordship, who, after a short correspondence with the committee, determined not merely to assist in purse, but in person and with arms in his hands. With his usual haste and impetuosity, he prepared forthwith to leave Italy. During his stay in that beautiful country, he had written the fourth canto of Childe Harold; Beppo, a Venetian story; Mazeppa; Manfred; the Lament of Tasso; Ode to Venice; the Prophecy of Dante (wherein he imitated, not very successfully, the terza rima of the Italians); Cain, a Mystery; Marino Faliero, the Two Foscari, Sardanapalus and Werner, tragedies; the Cantos of Don Juan (the most astonishing of all his productions); the Vision of Judgment; and many fugitive pieces.

With his head full of warlike notions, Byron sailed from Genoa on the 14th of July; on the 19th he put into Leghorn to purchase gunpowder and other commodities for the Greeks, and sailing again on the 24th, he reached the island of Cephalonia in about ten days. He had scarcely arrived there and looked a little into the affairs of the Greeks, when he repented of his expedition. 'I was a fool,' he wrote to a friend, 'to come here; but being here, I must see what is to be done.' He, however, showed a talent for public business that surprised most people, and a degree of good common sense that contrasted very advantageously with the wild theoretic dreamings of many of the Philhellenes who had repaired to Greece.

At the end of December, 1823, his lordship sailed from Cephalonia, and after a narrow escape from a Turkish frigate landed at Dragomestri, a wretched seaport of the Greeks on the coast of Acarnania. In sailing from this point to Missolonghi he was near suffering shipwreck, and by an act of imprudence sowed the seeds of the malady that soon terminated his existence. On the 3rd of January, during a rough and cold night, he leaped into the sea, and swam a long way: two or three days after he complained of a severe pain in all his bones, which continued more or less to the time of his death. He reached Missolonghi on the 10th of January, 1824, where he found everything in a most perplexing and almost hopeless state of anarchy and confusion. He set to work with spirit and application, and again showed a great aptitude for the despatch of public business. The weather was detestable and the place unhealthy. At the beginning of February he got wet through; on the evening of the 15th he was seized with a dreadful convulsive fit, and was for some time speechless and senseless. Soon after this paroxysm, while stretched on his bed faint with over-bleeding, a crowd of mutinous Suliotes whom he had engaged to fight for their country burst into his apartment brandishing their arms, and furiously demanding their pay. Sick and nerve-shaken as he was, Byron is said to have displayed great calmness and courage on this trying occasion, and his manner soon inspired the mutineers with respect and awe. At the end of January he had received a regular commission from the Greek government, and was appointed to the command of an expedition that was to besiege Lepanto, then in the hands of the Turks. The difficulties and obstructions encountered by his lordship in preparing and providing for this siege were perplexing and irritating in the extreme, and altogether too much for a man whose health was evidently undermined. Still, however, he would not listen to those who advised him to retire. 'I will stick by the cause,' said he, 'as long as a cause exists.'

On the 9th of April he again got wet through, and returned to Missolonghi in a state of violent perspiration. Fever and violent rheumatic pains ensued. On the following day he took a ride among the olive woods, but complained of shudderings, and had no appetite. On the evening of the 11th he was much worse, and by the 14th he was evidently in danger. For several days he obstinately refused to let his medical attendants bleed him, and when he gave his consent the bleeding was too late. Inflammation fell upon his brain, and he expired at six o'clock on the afternoon of the 19th of April, 1824, being only 36 years and three months old. The bitter grief of his followers and attendants of all nations was a proof of his frequent kindness of heart, and his goodness as a master.

As a poet of description and passion he will always occupy a high place, though we doubt much whether he will preserve in after-ages the absolute supremacy which so many of his contemporaries gave him as his right. When, in the progress of taste and right feeling, the public mind shall be attuned to the deep, tender, and philosophic strains of Wordsworth, we are inclined to believe that the author of the 'Excursion' will rank higher than the author of 'Childe Harold.'

The least successful of Byron's productions, notwithstanding the admirable passages in which they abound, are his tragedies: the work which gives us the highest notion of his genius, power, and versatility is his 'Don Juan.' The Don is at times free and almost obscene, and the whole tendency of the poem may be considered immoral; but there are, scattered throughout it, the most exquisite pieces of writing and feeling,—inimitable blendings of wit, humour, raillery, and pathos, and by far the finest verses Byron ever wrote. He may be said to have created this manner; for the Bernesco style of the Italians, to which it has been compared, is not like it. (*Letters and Journals of Lord Byron, with Notices of his Life, by* Thomas Moore; Galt's *Life of Lord Byron;* Dallas's *Memoir;* Lady Blessington's *Conversations with Lord Byron.*)

BYRON, JOHN, second son of William Lord Byron, by his third wife Frances, second daughter of William Lord Berkeley of Stretton, was born Nov. 8, 1723. He was engaged as midshipman on board the Wager, the store-ship which accompanied Lord Anson's squadron in its voyage round the world, commenced in September, 1740. That vessel, an old East Indiaman, fitted out as a ship of war, and deeply laden, was manifestly deficient in equipment, and the expedition was unfortunately delayed till a season very unfitting for the navigation on which it was to be employed. On the 15th of May the Wager, having before parted company with the remainder of the squadron in consequence of her bad sailing, struck on a sunken rock about the latitude 47° S. on the western coast of America. Her condition was so crazy that she soon afterwards bilged, and grounded between two small islands about a musket-shot from the shore. Her captain, who had succeeded to the command during the voyage in consequence of the death of his superior officer, appears to have rendered himself hateful to the ship's company by imperious and tyrannical conduct; and the crew, on the other hand, were mutinous and insubordinate. No hope of preserving the vessel remained, and the mariners were happy in being able to land upon a wild shore, which afterwards proved to be part of an uninhabited island, and the wretchedness of which may be inferred from the name which the sailors gave it, 'Mount Misery.' After several months' residence, part of the crew embarked in the cutter and long-boat to attempt the passage of the Straits of Magelhaens, and a homeward return by Brazil. The cutter was lost, but the long-boat, after undergoing incredible hardships and sailing more than 1000 leagues, arrived at the Portuguese settlements in Brazil. A narrative of this remarkable enterprise was published by two of the survivors, John Bulkeley and John Cummins, late gunner and carpenter of the Wager. Byron and his companions, after enduring the utmost extremity of famine, bad weather, cold, fatigue, hunger, sickness, and general destitution, and having made one useless attempt to quit the island, were relieved by a Chanos Indian cacique, who conveyed them to the island of Chiloe, after thirteen months had expired since the loss of the Wager. The hardships which the party endured defy abridgment, but the narrative which Byron published on his return to England in 1745 is among the most interesting accounts of nautical adventures with which we are acquainted. Byron was seldom unemployed; he afterwards served with some distinction in 1758 during the war against France; in 1760 he performed a brilliant service in destroying a French squadron in Chaleur Bay, and on the return of peace in 1764 he was despatched on a voyage of discovery to the South Sea, in command of the ships Dolphin and Tamar. Although his discoveries were by no means great, he may be considered as one of the ablest precursors of Captain Cook, in the preliminary volume to whose voyages, collected by Hawkesworth, Byron's journal occupies the first place.

He was afterwards, in 1769, appointed governor of Newfoundland. In 1778 he commanded the fleet destined to observe the movements of the French admiral M. d'Estaigne in the West Indies, but profiting by his great superiority in numbers (27 ships of the line to 21), eluded every attempt to bring him to close engagement. During this expedition he received the highest promotion which he attained, that of Vice-Admiral of the White. In 1748 he married Sarah, daughter of John Trevanion, Esq., of Cartrays, in the county of Cornwall, who outlived her husband only one month, and bore him two sons and seven daughters. Commodore Byron, as he is usually styled, died in London on April 10, 1786, in the enjoyment of a high and merited reputation for courage and professional skill.

BYSSOARCA, a subgenus separated by Swainson from the genus Arca of Linnæus, and considered by the former as the sedentary type of that genus. The following is the subgeneric character given by Swainson in his second series of 'Zoological Illustrations.' Animal fixed by byssiform filaments to other bodies; shell transverse; umbones remote; valves gaping in the middle of the ventral margin.

'The animals of these shells,' says the author last quoted, 'affix themselves to other bodies by a particular muscle, which is protruded through the gaping part of the valves; they also adhere when young by the byssiform epidermis which covers the exterior. A specimen now before us, which we procured in the bay of Naples, perfectly exemplifies this singular property.' Mr. G. B. Sowerby has described several new species collected by Mr. Cuming on the western coast of South America and among the islands of the South Pacific Ocean, in the Proceedings of the Zoological Society of London for 1833. Byssoarca has been found moored to stones and shells at depths varying from the surface to seventy-five fathoms.

Fig. 2. *Fig.* 3.

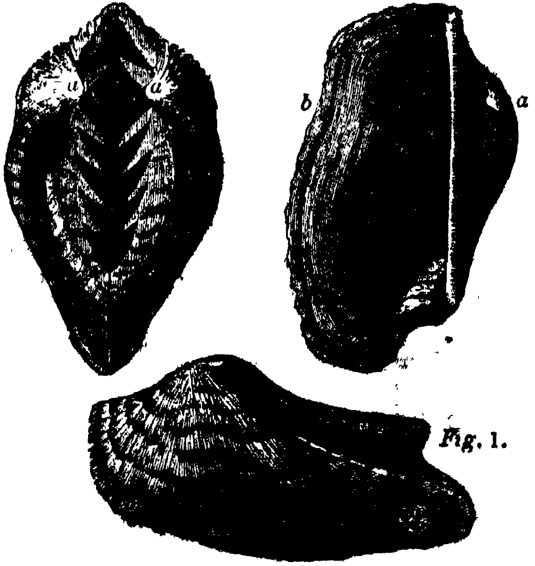


Fig. 1.

[Byssoarca Noæ.]

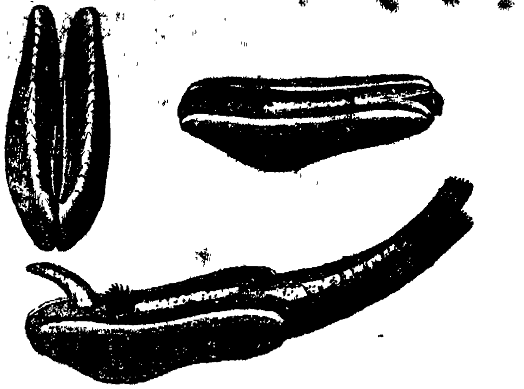
1 Valves closed. 2. Valves closed, view of the hinge area. 3. A single valve, showing the hinge teeth and the interior of the valve. *a*, Umbones. *b*. Part of the ventral margin where the valves gape, to give room for the extrusion of the tendinous foot.

BYSSOMYA, a genus of conchiferous mollusks separated by Cuvier, and placed by him under his acephalous testacea between *Pandora* and *Hiatella*. De Blainville, who approves of Cuvier's separation, observing that though the shell differs little from *Saxicava*, the animal is very distinct, arranges it in his family of *Pyloridea* between *Saxicava* and *Rhomboides*.

Generic Character.—Animal more or less elongated, subcylindrical, elongated behind by a long tube, which is bifurcated at its extremity only. A hole at the lower and anterior part of the mantle for the passage of a small conical, canaliculated foot, and of a byssus situated at its posterior base. Two strong adductor muscles.

Shell often irregular, covered with a strong epidermis, oblong, strongly striated longitudinally, æquivalve; very inequilateral, obtuse and wider before, and attenuated or rostrated, as it were, behind. Umbones but little developed, though distinct and a little curved forward. Hinge toothless, or only having a rudiment of teeth under the corselet. External ligament rather long. Two strong, distant, and rounded muscular impressions.

Example, *Byssomya Pholadis*, *Saxicava Pholadis* of Lamarck. The species inhabits the northern seas, living in the fissures of rocks, in company with *Mytili* (muscles), and attached by its byssus; but sometimes it buries itself in the sand or lodges in small stones, the roots of *fuci*, and even in the polymorphous *millepora*: in the latter cases, according to O. Fabricius, it is without byssus.


[Byssomya Pholadis.]

BYSSUS (conchology), the name of a long, delicate, lustrous, and silky fasciculus of filaments, by which some of the conchiferous mollusks (the *Mytilacea*, muscles, and *Malleacea*, Hammer oysters, for example) are moored to submarine rocks, &c. This is not, as some authors have stated, a secretion spun by the animal, but, according to De Blainville, an assemblage of muscular fibres dried up in one part of their extent, still contractile and in a living state at their origin, a condition which they enjoyed throughout their whole length at the period of their attachment. The tendinous foot of *Byssoarca* and *Tridacna* seems to be a step towards the organization of a true byssus. In the great *Pinna* of the Mediterranean this substance is well and largely developed, and its situation is in a fleshy sac or sheath at the base of the foot, which is attached towards the middle of the abdominal mass of the animal. In Italy the byssus is manufactured into various articles; and there are few museums without a glove or a stocking woven out of this substance.

BYSSUS (βύσσος). It has been a subject of some dispute whether the byssus of the antients was cotton or linen: but recent investigations have determined that it is linen, and not cotton; at least so far as the term has been applied by Greek and Roman writers to mummy-cloth. Herodotus states, that the Egyptians wrapped their dead in the cloth of the byssus; and it has been shown by microscopic observations, that every specimen of mummy-cloth yet examined is made of linen fibre. The name byssus came probably from the Phœnicians, and may be derived from בוץ butz. (Buxtorf's *Lexicon*.) It is possible that writers later than the time of Herodotus may sometimes have applied the term indifferently either to cotton or linen cloth. Cotton was known in the time of Herodotus (B.C. 484—408), who calls it tree-wool (εἴριον ἀπὸ ξύλου): but there is no evidence to prove that it was then cultivated in Egypt, or in any other country except India; or that it was in common use in Egypt. His remarks, so far as they go, seem to imply that the commodity was a rarity. (Vol. XXX. *Library of Entertaining Knowledge*, *Egyptian Antiquities*, Vol. II., Part I., Chapter v., pp. 182—196.)

BYZANTINE HISTORIANS is the name given to a series of Greek historians and writers who lived under the Eastern or Byzantine empire between the 6th and the 15th centuries. They may be divided into two classes:—1. The historians properly so called, whose collected works constitute a complete history of the Byzantine empire from the time of Constantine the Great to the taking of Constantinople by the Turks; and 2. The general chroniclers who have attempted to give a chronography of the world from the oldest times. The *historians* are:—1. Joannes Zonaras of Constantinople, first an officer of the imperial court and afterwards a monk of Mount Athos, who died about 1118, and wrote the 'Annals of the World,' in 18 books. In the first part of his work he belongs to the class of general chroniclers or compilers, but from the time of Constantine he treats more particularly of the history of the Eastern Empire, which he brings down to the death of Alexius I. Comnenus in 1118. 2. Nicetas Acominatus of Chonæ or Colossæ in Phrygia, who filled several high offices in the court of Isaac Angelus, and died at Nicæa in 1216. His 'History of the Byzantine Emperors' in 21 books begins with 1118 and ends with 1206. 3. Nicephorus Gregoras of Heraclea enjoyed the favour of Andronicus Palæologus the elder of the Palamites; but owing to the controversy, he was confined in a convent by the Patriarch, in 1351, where he died. He wrote a Byzantine, or, as he styles it, a 'Roman History' in 38 books, of which the first 24 only have been printed, containing the history of the Byzantine Empire from 1204 to 1331. The 14 remaining in MSS. bring the history down to 1359. 4. Laonicus (Nicolas) Chalcondylas of Athens wrote a 'History of the Turks and of the Downfall of the Greek Empire' in 10 books, to the year 1462. An anonymous writer has continued the history of the Turks down to 1565.—These four writers form by themselves an entire history of the Byzantine Empire from the time of Constantine to the Turkish conquest. The following writers have treated of detached periods of the same history, or have written the lives of particular emperors. 5. Procopius of Cæsarea in Palestine, the most celebrated of the Byzantine writers, wrote the 'History of his own Time' in 8 books, to the year 545. He also wrote a 'Secret History' (Anecdota) of the reign of Justinian down to the year 553, which, as to the manner in which he speaks of that emperor and of his court, contrasts singularly with the panegyrical tone of his former work. 6. Agathias of Myrina in Æolis, a poet as well as historian of the 6th century, is well known for his Anthology and his Daphniaca or amatory verse. [ANTHOLOGY.] He studied first at Alexandria, from whence he removed to Constantinople in 554, being then about 18 years of age, and applied to the study of the law, in which he became eminent. He was surnamed 'Scholasticus,' a word which then meant an advocate. He wrote a History in five books of the years 553-59 of Justinian's reign, which forms a sequel to Procopius. He died about 582. Agathias is one of the most trustworthy Byzantine historians; inferior to Procopius in talent and information, but superior to him in honesty. The impartial manner in which he speaks of the various parties and sects, and particularly of the two great religious systems which divided the world in his time, has made it a matter of dispute whether he was a Christian or a Pagan. His account of the Persians and their celebrated king Chosroes or Nushirvan is much valued for its accuracy and fairness. 7. Menander of Constantinople, surnamed Protector, continued the history of Agathias to the year 582. Menander's history is lost, but fragments of it are found in the works of Constantine Porphyrogennetus, which relate to the history of the Huns, the Avari and other northern and eastern races, and also to the negotiations and missions between Justinian and Chosroes. All that remains of Menander has been published by Bekker and Niebuhr, Bonn, 1829. 8. Joannes of Epiphania wrote a history of the Persian war under the emperor Mauricius, which has never been printed, and the only MS. of it known is in the Heidelberg collection. 9. Theophylactus Simocatta lived in the first part of the 7th century, and wrote a history in 8 books, from 582 till the death of Mauricius in 602. 10. Joannes, a monk of Jerusalem, in the 8th century, wrote a brief history of the Iconoclasts, which was published by Combéfis for the 'Corpus Historiæ Byzantinæ,' together with an anonymous work against Constantine IV., probably written by the same monk. 11. Theodosius, a monk of Syracuse, in the 9th century, has left a narrative of the taking of Syracuse by the Spanish Arabs. It was published, for the first time, by Hase, with the 'History of Leo Diaconus,' Paris, 1819. 12. Constantinus VI. Pophyrogennetus wrote the life of his grandfather Basilius the Macedonian, from 867 to 886. He also wrote several other works which may serve as illustrations of the Byzantine history, such as 'De Administrando Imperio,' on the Administration of the State, addressed to his son Romanus; 'De Ceremoniis Aulæ Byzantinæ;' 'De Thematibus,' or military divisions of the empire. He also caused several learned men to compile a kind of historical library out of the works of all previous historians. This great compilation was divided into 53 books, of which the titles of 26 only are known. One was on the succession of kings, another on the art of generalship, &c. Under each of these heads, passages from the various historians bearing upon the subject were collected. Three books alone, more or less mutilated, have come down to us. One, entitled 'De Legationibus,' is an account of the various embassies between the Romans and other nations; another 'De Sententiis,' and the third 'De Virtute et Vitio.' 13. Genesius of Byzantium wrote a history of Leo the Armenian, Michael II., Theophilus, and Michael III., embracing the period from 813 to 867. 14. Leontius of Byzantium, called the younger, wrote also a history of the same period, to serve as an introduction to Constantine's life of Basilius. 15. An anonymous writer has left a continuation of Constantine's life of Basilius, embracing the lives of Leo VI. and his brother Alexander, of Constantine VI. himself, and his son Romanus. 16. Joannes Cameniata of Thessalonica wrote an account of the taking of that city by the Saracens in 904, of which he was an eye-witness. 17. Leo Diaconus of Kaloë, born about 950, accompanied Basilius II. in his wars against the Bulgarians, and wrote the lives of Romanus, Nicephorus Phocas, and Tzimisces, from 959 to 975. 18. Michael Constantine Psellus wrote a history from the death of Tzimisces in 975 till the accession of Constantine Ducas in 1059. It has not yet been published. 19. Nicephorus Bryennius, the husband of Anna Comnena, wrote 'Historical Materials,' being a kind of memoirs of the Comneni family, to the accession of Alexius I. 20. ANNA COMNENA has written the history of her father Alexius. 21. Joannes Cinnamus, who lived towards the end of the 12th century, was imperial notary at Constantinople. He wrote the lives of John Comnenus, and of Manuel his son, from 1118, when Anna Comnena ends, till 1176. Like his predecessors he is partial against the Latins or Franks, and especially unjust towards Roger I. of Sicily, who was a great man for his time, though an enemy of the Byzantines. 22. Georgius Acropolita, born in 1220 at Constantinople, filled several important offices under Michael Palæologus, and died in 1282. There are two works under his name, one styled a 'Chronography,' and the other a 'Short Chronicle of the late Events,' both referring to the period from 1204, when the Franks took Constantinople, to 1261, when they were finally expelled. Acropolita has also written a 'General Chronicle from the Creation to the taking of Constantinople by the Franks,' which is not yet printed. 23. Georgius Pachymeres, born at Nicæa in 1242. After the recovery of Constantinople by the Greeks he was raised to high offices in the state. He wrote a 'Byzantine History,' which forms a continuation to Acropolita's work, and comes down to 1308. Pachymeres is a faithful but dull writer. He wrote also several philosophical works and a history of his own life. 24. Joannes Cantacuzenus, after his abdication of the empire in 1355, retired to a convent where he wrote a Byzantine history from 1320 to 1357. Cantacuzenus is in general a good authority for the history of that period in which he acted an important part, though he is of course somewhat partial in his own cause. 25. Joannes Ducas, of the imperial family of that name, fled from Constantinople at the time of the Turkish invasion, and took refuge at Lesbos under the Genoese adventurer Prince Castelluzzi. He wrote a Byzantine history, which begins from Adam, after the fashion of the chroniclers, and is but a brief general chronicle as far as the year 1341, after which his account becomes more circumstantial, being more especially occupied with the history of the latter period of the eastern empire: it ends with the taking of Lesbos by the Turks, in 1462. This latter part therefore forms a continuation to Cantacuzenus. 26. Joannes Anagnostes of Thessalonica has left an account of the taking of that city by the Turks in 1430. 27. Joannes Cananus has written a history of the war against Sultan Murad II. in 1420. 28. Georgius Phranza, born in 1401, of a family related to the Palæologi, filled some of the highest offices in the state under the last emperors. He was made prisoner by the Turks at the taking of Constantinople, was sold as a slave, recovered his liberty, and took shelter for a time with Thomas Palæologus, prince of Peloponnesus. When the Turks invaded that part of Greece Phranza escaped to Italy, and at last became monk at Corfu in 1468. There he wrote his 'Chronicle' in 4 books, which begins with 1260 and ends with 1477, embracing the whole history of the Palæologi. The work of Phranza is most valuable, though it is full of digressions upon religious controversies, the origin of comets, &c.

The following are the general *chroniclers* properly so called, who are also included under the general appellation of Byzantine historians:—1. Georgius Syncellus lived in the eighth century. He wrote a 'Chronography' from the beginning of the world to the time of Diocletian, in which he has availed himself of Eusebius and Africanus. 2. Theophanes Isaacius of Constantinople, who died about 817, continued the chronicle of Syncellus from 280 till 813. 3. Joannes of Antioch, called Malalas, a [illegible]an word meaning a rhetor or sophist, lived in the ninth century, and wrote a chronicle from Adam till 566. 4. Joannes Scylitzes, who lived in the eleventh century, wrote a 'Short History' or chronicle from 811 till 1057, which he [illegible] recast and continued till 1081. 5. Leo Grammaticus wrote a chronography, which is a continuation of Theophanes', from 813 to 949. 6. [illegible]ius [illegible]achus has also left a chronicle embracing the same period as Leo's. 7. The Chronicon Paschale, called also Alexandrian Chronicle, is attributed by some to Georgius the Bishop of Alexandria, who lived in the seventh century. It is also called 'Fasti Siculi,' because the MS. was discovered in Sicily. It extends from the beginning of the world to 1042. 8. Georgius Hamartolus, an Archimandrite, wrote a chronicle to the year 842, which is yet unedited. 9. Joannes of Sicily wrote in the ninth century a chronicle from the creation of the world till 866, which is not yet printed. An anonymous continuation of it till 1222 exists in the imperial library at Vienna. 10. Nicephorus, Patriarch of Constantinople in the first part of the ninth century, has left a Breviarium Chronographicum, or short chronicle, from the creation to the author's death in 828, giving series of the kings, emperors, patriarchs, and bishops, &c. He wrote also a Breviarium Historicum, or general history of events from 602 to 770. 11. Julius Pollux, not the author of the Onomasticon, wrote a chronicle with the title of 'Historia Physica,' from the creation to the reign of Valens. A MS. in the national library at Paris brings it down to the death of Romanus the younger in 963. This chronicle is chiefly engrossed with church matters. 12. Georgius Cedrenus, a monk of the eleventh century, wrote a chronicle compiled chiefly from the former chronicles of Scylitzes and others. It is mixed up with fictions, and is one of the least valuable in the Byzantine collection. 13. Simeon Metaphrastes filled some high stations at the imperial court in the first part of the tenth century. His chronicle comes to 963, and has the merit of being compiled from the works of ten lost writers who lived between Leo Grammaticus and Michael Psellus. 14. Hippolytus of Thebes lived towards the end of the tenth and the beginning of the eleventh centuries. He wrote a chronicle from the birth of Jesus Christ to his own time. 15. Michael Glykas, whose country and age are not ascertained, wrote a chronicle from the creation to the year 1118. It is valuable both for its historical and its biblical references. 16. Constantine Manasses, who lived in the twelfth century, has left a chronicle in verse down to 1081. 17. Ephræmius, believed to be the son of John XII., patriarch of Constantinople, wrote a chronicle in iambics of the emperors, from Julius Cæsar to the restoration of the Byzantine empire after the Frankish invasion. It is followed by a chronology of the patriarchs of Constantinople till 1313. The whole poem contains 10,410 lines. Angelo Mai published it first in his Vatican collection of inedited MSS. 18. Joel wrote a short general chronicle of the world to the Frankish invasion of Constantinople in 1204. 19. Theodosius of Melite has left a chronicle which is not yet printed. Professor Tafel of Tübingen has published a notice of this writer: 'De Theodosio Meliteno inedito historiæ Byzantinæ Scriptore,' 4to. Tübingen, 1828, from the MS. of his chronicle which is at Tübingen, and which was brought from Constantinople by St. Gerlach in 1578. 20. Hesychius of Miletus, who lived under Justinus and Justinian, wrote a history of the world, which is lost, except a valuable fragment on the origin of Constantinople, which has been extracted and preserved by Codinus.

Besides the above historians and chroniclers there are other Byzantine authors who have written on the statistics, politics, antiquities, &c. of the Roman empire, whose history properly so called they serve to illustrate, and who are generally included in the collection of Byzantine historical writers. Among these Procopius stands foremost by his curious work, 'De Ædificiis Domini Justiniani,' lib. vi., which contains a brief notice of the towns, temples, convents, bridges, roads, walls, and fortifications built or repaired under the reign of Justinian. 2. Joannes Laurentius, called

Lydus from his being a native of Philadelphia in Lydia, lived under Justinian, and was both a poet and prose writer. He has left a work 'on the Roman Magistrates,' which affords valuable assistance for the knowledge of Roman civil history. The MS. was first discovered by Choiseul Gouffier and Villoison in the library of Prince Morousi at Constantinople in [illegible], and is now in the public library at Paris. [illegible] shed [illegible] Hase at Paris, 1812. In the same [illegible] found [illegible] work of Lydus, 'De Ostentis,' [illegible] divination or [illegible] science,' which has been also published by Hase [illegible] in 1823. 3. Hierocles, called the gramm[illegible] guish him from the [illegible] of the same [illegible] Synecdemos, or tra[illegible] guide, in which he de[illegible] the 64 provinces of the Eastern empire, and the 935 citi[illegible] towns contained in it. It has been published in several collections, among others in Banduri's 'Imperium Orientale,' Paris, 1711. Some suppose that Hierocles lived under Justinian, others later, but certainly previous to the tenth century. 4. Theophylactus, archbishop of Achris in Bulgaria in the latter part of the eleventh century, wrote a work 'on the Education of Princes,' intended for the young Constantine, the son of Michael VII., Parapinaces. It is published in Banduri's 'Imperium Orientale.' 5. Alexius I. Comnenus wrote 'Novum Rationarium,' or Inventory of the Revenues of the State, in imitation of Augustus. It has been published in the collection of the Benedictines, Paris, 1688. 6. A monk, of unknown name, who lived under Alexius I., wrote a book on the antiquities of Constantinople, which gives a description of its buildings, monuments, &c. It is inserted in Banduri's 'Imperium.' 7. Matthæus Blastares, a monk, wrote, about 1305, an account of the numerous household charges and offices in the imperial palace of Constantinople, which is inserted in the eighteenth volume of the Venetian edition of the 'Corpus Hist. Byzant. Scriptorum.' 8. Georgius Codinus, surnamed Curopalates, lived in the latter age of the empire, and wrote 'on the Dignities and Offices of the Church and Court of Constantinople.' He has also left 'Extracts from the Chronicle of Hesychius on the Origin and History of Constantinople.' 9. The Emperor Manuel Palæologus wrote a book 'on the Education of Princes.' He also wrote 'a Dialogue with a Turk held at Ancyra in Galatia,' where Manuel was once stationed in winter-quarters with his auxiliary corps serving under Sultan Bajazet. This work, which is yet unpublished, is said to give an interesting view of the tottering condition of the once mighty empire towards the beginning of the fifteenth century. There are also 66 unpublished letters of Manuel in the public library at Paris, which contain interesting allusions to the history of that period. (See Hase, *Notices et Extraits des Manuscrits de la Bibliothèque du Roi*, vol. ix.)

Most of the above Byzantine historians, chroniclers, and other writers were collected and published in the great edition made by order and at the expense of Louis XIV., in 36 vols. fol. Paris, 1645—1711. The jesuits Labbe and Maltrait, Petau and Poussines, the Dominicans Goar and Combéfis, Professor Fabrot, Charles du Fresne Seigneur du Cange; Allacci, the librarian of the Vatican; Banduri, librarian at Florence; Boivin, the king's librarian at Paris; and Bouilliaud, a mathematician, were each entrusted with parts of this splendid work. The Greek text is accompanied with a Latin translation, and notes. The last volume contains the Arabian chronicle of Abu Ben Raheb, which serves to illustrate Byzantine history.

Another edition was published at Venice in 23 vols. fol. 1729, and the following years, which contains several works omitted in the Paris edition, such as Phranza, Genesius, and Malalas. Others were published separately afterwards as a supplement to the Venice edition: 'Opera Georgii Pisidæ, Theodosii Diaconi et Corippi Africani,' Rome, 1777, folio. 'Julii Pollucis Historia sacra,' Bononiæ, 1779, folio. 'Constantini Porphyrogenneti libri ii. de Ceremoniis Aulæ Byzantinæ,' 2 vols. fol. Leipzig, 1751. 'Leonis Diaconi Caloensis Historia,' by Hase, fol. Paris, 1819. Several of the Byzantine historians, however, still remain inedited, as we have above observed.

A new edition of the Byzantine historians was projected by the late B. G. Niebuhr: 'Corpus Scriptorum Historiæ Byzantinæ. Editio emendatior et copiosior,' etc. 8vo. Bonn, 1828, and following. It is proceeding, since Niebuhr's death, under the care of Bekker, Dindorf, and other philologists. About 20 volumes have already appeared. (For a full account of the Byzantine writers see Schoell's *History of Greek Literature*, and Fabricius, *Bibliotheca Græca*, editio nova, vols. vii. and viii.)

BYZA'NTIUM (Βυζάντιον, on the coins sometimes Βυσαντιον), an antient Greek city, which occupied part of the site of modern Constantinople. According to Eusebius and other antient authorities, Byzantium was founded by a colony from Megara, Ol. 30, 3, or 658 B.C., 17 years after the building of Calchedon,* on the opposite or Asiatic shore of the Bosporus, by another colony from Megara. Others say that the first colonists of Byzantium were a mixed people from Megara and Argos. They were, however, a Dorian colony, and Doric customs and the Doric dialect continued to prevail at Byzantium for many centuries. Tacitus (*Ann.* xii. 63) relates, in accordance with Strabo, a tradition that the colonists having asked the oracle of Apollo where they should build their new town, were told to look for a spot opposite to the 'land of the blind,' alluding to the previous Calchedonian colonists, who had built their town in an inferior position when they had the option of the site of Byzantium. Strabo (p. 320, Casaub.), Pliny, and other antient writers, speak of the abundance of fish in the sea of Byzantium, especially of the Pelamys kind, which, coming down in shoals from the Palus Mæotis, and round by the eastern and southern coast of the Euxine, entered the Bosporus, whence the harbour of Byzantium was called 'the golden horn,' in consequence of the riches derived from the fishery. (Plin. *Hist. Nat.*, ix. 15.) The Byzantines salted the fish, which was an article of considerable trade. The harbour of Byzantium became a place of resort for vessels trading with the Euxine, the northern coasts of which already, in the time of Herodotus, supplied with corn, as they do now, Greece and other countries of the Mediterranean.

The name of Byzantium is said to be derived from Byzas, the leader of the Megarian colony: Neptune, it is said, was his father; a parentage which indicates that Byzas hardly belongs to the historical age. The Byzantines and Calchedonians in conjunction founded Mesembria. Another Megarian colony had founded Selymbria, and the Megarians had also a share in the foundation of Heraclea on the Pontus. In the reign of Darius Hystaspes, the Persian satrap Otanes took Calchedon and Byzantium. After the battle of Platæa, Pausanias, at the head of the united Greek forces, took Byzantium, and a fresh colony of mixed Athenians and Lacedæmonians was sent to it. This second colony has given occasion to Justinus and other writers to say that Byzantium was founded by Pausanias. The Lacedæmonians kept possession of Byzantium till Pericles took it from them, but they retook it shortly after. Alcibiades again got possession of it by a stratagem and by holding communication with some persons within the place. (Plutarch, *Alcib.*) Lysander recovered it soon after, and it was under the Lacedæmonians when Xenophon, with the remnant of the 10,000, passed through it on his way home, and his men had a serious affray with the Lacedæmonian governor, which was with difficulty settled by the prudence of Xenophon. Thrasybulus drove the Lacedæmonians away, 390 B.C., and changed the form of government, which was before aristocratical or rather oligarchical, into a democracy. It appears, however, that there was a class of the original inhabitants of the country who were treated by the Greek Byzantines pretty much as the Helots were treated at Sparta. (O. Müller, *History of the Doric Race*, iii. ch. 4.) After the recovery of their liberty, Byzantium seems to have prospered for a time, and it became the head of a sort of confederacy of the neighbouring maritime towns. It also joined Rhodes, Cos, and Chios in the league with King Mausolus against the Athenians, who sent an expedition against Byzantium, which however failed. Some time after, Philip of Macedonia having extended his conquests into Thrace, laid siege to Byzantium. The Byzantines made a bold defence, and Philip's army became distressed for want of provisions and money. Philip relieved his wants by seizing 170 ships and confiscating their cargoes. On a dark night, Philip's soldiers were near surprising the town, when a 'light shone suddenly from the north,' and revealed to the inhabitants their danger. In gratitude for this, the Byzantines built an altar to Diana, and assumed the crescent as the emblem of their city. The crescent is found on several medals of Byzantium, and it is said that the Turks, on their conquest of Constantinople, adopted it for

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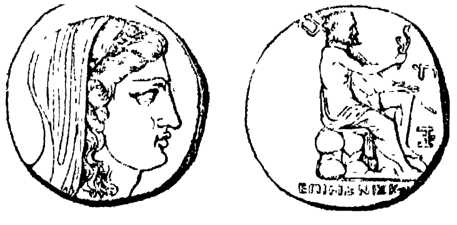
* The common but incorrect mode of writing the name is Chalcedon.

[Coin of Byzantium. Brit. Mus. Copper. 123 gr.]



[Brit. Mus. Silver. 206 gr.]

their own device. Baffled in his attempt, Philip raised the siege and turned his arms against the Chersonesus. Under Alexander the Great and Lysimachus, who, after his death, succeeded to the government of Thrace, Byzantium was obliged to submit to the Macedonians, but it afterwards recovered its municipal independence, which it retained till the time of the Roman emperors. Its maritime commerce was prosperous, but it was exposed on the land side to continual incursions of Thracians, Scythians, and other barbarians, who ravaged its territory, cut down the harvest, and reduced it to great distress. The most troublesome of these incursions was that of the Gauls, who overran Macedonia and Northern Greece about 270 years B.C. The Byzantines, in order to have some respite from them, were obliged to pay heavy sums, from 3000 to 10,000 pieces of gold a year, and at last as much as 80 talents, to save their lands from being ravaged in harvest-time. These and other burthens compelled them to have recourse to extraordinary measures for raising money, one of which was the exacting of a toll from all ships passing through the Bosporus, which became the cause of the war between Byzantium and Rhodes about 221 B.C. (Böckh *on the public Economy of the Athenians*, b. iii.) The Gauls at last went over to Asia, and left Byzantium in peace. The Rhodians, a maritime trading people, refused to pay the toll on their ships passing through the Bosporus, which led to a war with Byzantium, in which Prusias I., king of Bithynia, sided with the Rhodians, and Attalus I., king of Pergamus, took the part of the Byzantines. The latter had the worst of it, and peace was made by the mediation of Cavalus or Cavarus, king of the Gallo-Græci.

Athenæus, Ælian, and other antient compilers, give rather an unfavourable account of Byzantine morals and manners. Idleness and debauchery prevailed, the citizens spent their time in the market-place, or in the numerous public houses of the city, and let their houses and wives to strangers. The sound of a flute put them immediately in a merry mood, but they fled from that of a trumpet, and their general, Leo or Leonidas, in the siege by Philip, had no means of keeping them to watch and defend the walls but by causing the sutlers and canteens to be established along the ramparts. (Athenæus, x, p. 442; Ælian, *Hist.* iii. 14.) Byzantium was full of foreign and native merchants, sailors, and fishermen, whom the excellent wine sold in the town and supplied by Maronæa and other districts seldom permitted to return sober to their ships. A democracy of such jolly carousers could not be expected to be very strict and orderly in its administration, and it is recorded of a Byzantine demagogue that being asked in some particular case what was the law of the country, he answered, 'Whatever I please. (Sextus Empiricus *adversus Rhetores*, 37; O. Müller, *History of the Doric Race.*) Dion says that the walls of Byzantium were built of massive square stones fastened together with iron bolts, and fitting so well together that the whole wall appeared to be one block. The Byzantines at one time had 500 ships, several of them with rudders at both ends, so as to be able to steer either way without veering or tacking. Tacitus speaks of such vessels being used in the Euxine in his time. (*Histor.*, iii. 46.) As for the extent of old Byzantium previous to the time of Constantine, there is some discrepancy of authorities; but it appears almost certain that it was much larger than has generally been supposed. The common opinion is that its area corresponded to that of the present seraglio and gardens of the sultan; but it appears to have occupied at least 4 of the 14 regions of the subsequent city of Constantinople, namely the 4 most easterly ones, Nos. 1 to 4. (Codinus, *Fragment of Hesychius on the Origin of Constantinople;* and Banduri, *Imperium Orientale*, vol. i. on the antiquities of the same, with the maps of Constantinople in vol. ii.) Dionysius Byzantinus gives it 40 stadia in circumference. The acropolis or citadel stood on the hill where the seraglio now is.

Byzantium allied itself to Rome against Philip II. of Macedonia, as well as against Antiochus and Mithridates. In consequence of its services it retained its liberty as a free town confederate with Rome, and its envoys were treated as foreign ambassadors. Some domestic disputes however occasioned an appeal to Rome from the losing party, and Clodius the tribune carried a decree enjoining the Byzantines to readmit the emigrants. Piso was sent to enforce this decree, but his conduct there appears to have been that of a hostile conqueror rather than of an ally and mediator. (Cicero *de Provinciis Consul.*) After Piso's departure the Byzantines resumed their former independence. They were subject to a tribute however, at least under the first emperors, which Claudius remitted for five years, in consideration of their losses during the Thracian war. (Tacitus *Ann.* xii. 62.) In consequence of some fresh domestic broils, however, Vespasian took away their liberties and sent them a governor, and when Apollonius of Tyana remonstrated with the emperor on the subject, Vespasian replied that the Byzantines had forgotten how to be free. In the civil war between Severus and Pescennius Niger, the Byzantines took the part of the latter. After Niger's death Severus besieged the town, which the inhabitants defended for three years with the courage of despair. At last famine obliged them to surrender, and Severus treated them with his characteristic inhumanity. The armed men and the chief citizens were put to death, the walls were razed, and the remaining inhabitants were placed under the jurisdiction of Perinthus. Severus however relented afterwards, and, visiting Byzantium, took pains to embellish the town; he built magnificent baths, porticoes round the Hippodrome and other buildings, and gave it the name of Augusta Antonina, in honour of his son Antoninus Bassianus. [CARACALLA]. The Byzantines having rebuilt their walls, and recovered their prosperity, had next the misfortune of somehow displeasing Gallienus, a worse man than Severus, who entered the town under a promise of amnesty, and had most of the inhabitants massacred. Trebellius Pollio says that in his time there were no old families in Byzantium, except those who had left the town before Gallienus entered it. The town however was restored, and it repelled an irruption of the Goths, who had entered the Bosporus under Claudius II. After the defeat of Licinius by Constantine, Byzantium surrendered to the latter, who was so struck with its situation that he determined to build a new city by the side of old Byzantium, which he called Nea Roma, and which he chose afterwards for the capital of the empire. In May A.D. 330, the new town, which had been commenced only three years before, was dedicated to the Virgin Mary, and the feasts lasted 40 days. [CONSTANTINOPLE.]

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C.

C. This letter is derived from the Latin alphabet, in which it first appears. But even in that alphabet it originally possessed the power of *g*, as pronounced in *goose*. Thus the Roman proper names *Caius* and *Cneius*, which retained this sound, are correctly represented in the Greek character by *Gaios* and *Gnaios*; and the Duilian inscription presents *macestratus*, *leciones*, *pucnandod*, *ecfociont*, in the place of the modern forms, *magistratus*, *legiones*, *pugnando*, *ecfugiunt*. Indeed the poet Ausonius expressly states that C once performed the duty of G: *Gammæ vices functa prius* C. (See also Festus, *vv. Prodigia, Orcum.*) This medial pronunciation corresponds with the power of the letters which occupy the third place in the Greek and Hebrew alphabets, *gamma* and *gimel*; and the identity of the letters is confirmed by the similarity of the forms. [ALPHABET, p. 384, col. 2.]

The letter *c* in English is pronounced as *s* before *i*, *e*, and *k* before *a*, *o*, *u*. This variety in the power of the letter seems difficult to account for; but it may be observed that *i*, *e*, belong to one end of the vowel series, *a*, *o*, *u*, to the other [ALPHABET, p. 379, col. 2]; and it is further to be noticed that the vowels *i* and *e*, when they precede vowels, have a power approaching to that of *y* in *youth*, and that if in addition to this, *c* or *g* precede, there often results a sound like that at the beginning of the words *church* and *John*, and this sound of *ch* is not very different from a sibilant. The vowels *i* and *e* produce a similar sound when preceded by a *d* or *t*, and followed as before by a vowel. Thus from *ration* the Italians have obtained *ragione*; and from *radio*, *raggio*; from Diana the rustics of Italy made Jana. These considerations are perhaps supported by the employment of the little mark called *cedilla* in the French language, which is used to denote that *c* is to be pronounced as an *s* even before the other vowels, as *ça*; for the mark appears to have been originally an *i*. The connexion of the sounds *k* and *s* will be again spoken of.

The letter *c*, when pronounced as in *cat*, belongs to the order of guttural or throat letters, and among these it is distinguished by that character which grammarians have denoted by the Latin word *tenuis*, 'thin.' The correct distinction of the letters called *tenues*, as opposed to those which bear the name of *medials*, is perhaps this, that in the pronunciation of the *tenues p*, *k*, *t*, the organs employed in articulation have only a small portion of their surfaces brought into contact, and that but for a short time: while in the articulation of *b*, *g*, *d*, the surface in contact is more extensive, and the effort less rapid.

The letter *c* is liable to the following interchanges:—

In the derivation of French words from the Latin, *c* re *a* is changed into *cha* or *che*; ex., the Lat. *camera*, ulted chamber, *castus*, chaste, &c., *carus*, dear, *cadere*, *casa*, cottage, appear in French under the forms, re, *chaste*, &c., *cher*, *cheoir*, *chez*, &c. In this way nglish language has derived *channel*, *chivalry*, *char-* *hattels*, through the French from the Latin *canalis*, *lus*, *caro* (*carnis*), *capitalia*; and at the same time sses the words *canal*, *cavalry*, or *cavalcade*, *carnival*, , derived from the same roots, but by a different route. ne *patois* prevailing in the N.E. of France, the sound ne *k* still remains in these words, *chemin* being pro- nced *kemin*, *chat* as *cat*.

The change of *c* into *ch* prepares us in some measure that of *c* into *s*, as Lat. *facimus*, we do, Fr. *faisons*; *placere*, *licere*, Fr. *plaisir*, *loisir*, Eng. *pleasure*, *ure*. This interchange of *c* and *s* is strongly exempli- in the comparison of the western languages of Europe those lying towards the east. Thus we have in n, *canis*, dog; *conca*, shell; *centum*, hundred; *decem*, en; *cannabis*, hemp; in Greek, *kuon* (κυων), *konche* κογχη), *hekaton* (ἑκατον), *deka* (δεκα), *kannabis* (κανναβις); Sanscrit, *svan*, *sanca*, *sata*, *dasan*, *sana*; and in Russian, forms for *calamus*, *cor*, *centum*, *canis*, are *soloma*, *se*, *soll*, *sobāka*. It should be stated, however, that in the Sanscrit alphabet, which is thus convertible with of the west, is a letter of a peculiar character, and is ked by a distinct symbol. Even Herodotus has ob- l (ix. 20) that the commander of the Persian cavalry, stios, was called by the Greeks Makistios, and the same interchange may occasionally be seen in the Teutonic languages, as in the German *faust* and *fechten*, Eng. *fist* and *fight*, words as certainly related as the Latin *pugnare* and *pugnus*. The pronunciation of the Latin *c* as an *s* in such words as Cicero, Cæsar, is proved to be incorrect by the Greek equivalents *Kikeron* (Κικερων), *Kaisar* (Καισαρ), and no less so by the co-existence of such forms as *acer*, *acris*; and it would be trifling to defend the pronunciation by the accidental identity in form of the Roman *c* and one of the many symbols for the Greek sigma. [ALPHABET, p. 383, columns 33 and 36.]

3. *C* initial of the Latin language corresponds to *h* in the German. Compare *collum*, *hals*, neck; *celare*, *hehlen*, hide; *cutis*, *haut*, hide; *cannabis*, *hanf*, hemp; *canis*, *hund*, hound; *cornu*, *horn*, horn; *calamus*, *halm*, stalk; *caput*, *haupt*, head; *cor* (*cord*), *herz*, heart; *crates*, *horte*, hurdle. Traces of the same change are visible within the Latin itself, as *traho*, *traxi* (*trac-si*); *veho*, *vexi* (*vec-si*); and the town of Apulia, called by Strabo Kerdonia, is called by Roman writers Herdonia. So the Greeks had *ossos* (οσσος), an eye, while the Romans preferred *oculus*.

4. *C* is convertible with *v* and *w*. This may be seen in the related forms *Dacus*, *Davus*; *focus*, *foveo*; *nix*, *nivis*; *conniveo*, *connixi*; *lacus*, *lavo*; *vivo*, *vixi*; *struo*, *struxi*. Thus too the English * *quick* (the original meaning of which is seen in the phrases 'the quick and the dead,' 'the quick of the nail,') is identical with the Latin *vivus*; and we have another remarkable example in the derivation of our words *eleven* and *twelve* from the Latin *undecim*, *duodecim*. [See L.]

5. *C* into *g*. The change already mentioned of the power of the Roman symbol *C* is a sufficient proof of this. We may add *eager*, *meagre*, derived through the French *aigre*, *maigre*, from the Latin *acer*, *macer*. The old meaning of *eager* in Shakspeare is sharp, sour, as *eager milk*; and indeed the word appears again in *vinegar*, *vinaigre*. So too *aveugle*, blind, must have come from a Latin word, *aboculus*. The same change appears in the Teutonic. To the Latin *oculus* corresponds the German *auge*; to *duc-o*, *zog* and *zug*; while the Latin *lacr-uma*, or Greek *dakr-uon*, has in Gothic the form *tagr*, a tear.

6. The interchange of *c* with *p* is most remarkable in the Greek and Latin languages, the former commonly preferring the labial. Gr. *pepo*, Lat. *coquo*, cook; Gr. *leipo*, Lat. *linquo*, leave; Gr. *pipto* (or rather *pi-pet-o*), Lat. *cad-o*, fall, &c. The same interchange appears within Italy itself: the pigeon in Rome was called *columba*, the pigeon out of Rome, that is the wild pigeon, was called *palumba*; so *proximus*, nearest, has supplanted *propsimus*, from *prope*, near. The Latin word *quicquid* was pronounced by an Oscan as *pitpit*, and Augustus, we are told by Suetonius (Octav. 88), cashiered an officer for his ignorance in spelling *ipse* with an *x*.† This convertibility of the *tenues* extends to the letter *t*. Thus we find *scapula* and *spatula* both conveying the notion of a *blade*. The Greek *tetartos*, fourth, *tis*, who, *te*, and, appear in Latin as *quartus*, *quis*, *que*. The old name of the rock of Gibraltar assumes the various forms, *Calpe*, *Carpe*, *Carte*, *Tarte*. And in English we have *nut*, from Lat. *nuc*, and, on the other hand, *cork* from *cort-ex*.

7. Latin words beginning with *cu* have often lost the guttural. Thus *ubi* occupies the place of *cubi*, an old dative of the relative (compare *sicubi*, *alicubi*, &c.); *uter* of *cuter* (compare the Greek *koteros*), *umquam* of *cumquam* (compare together *quis*, *cum*, *quisquam*). This variety appears in our own tongue, where *which*, formerly *whilk*, was once written *quhilk*.

8. *C* often disappears before *l* and *n*. This naturally arises from the difficulty of pronunciation, as in *knee*, Lat. *genu*; *know*, Lat. *gno-sco*; thus from the old Frank name Clodovick are derived Clovis, Louis, Ludovicus, Ludwig, Lovick.

9. In the derivation of Italian and French words from the Latin, *c* disappears before a *t*, the preceding vowel being

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* In some of the provinces of England 'wick' is used in the sense of quick. A thing that is alive is said to be 'wick.'

† In our own language we have *rock* (Fr. *roche*), from the Latin *rupes*, *scum* (Fr. *écume*) from *spuma*.

com [illegible] as Lat. *dictus*, said, It. *ditto*, Fr. *dit*; [illegible] *us*, cooked, It. *cotto* (whence *terra cotta*). Fr. *cuit*, [illegible] *cuit*, twice baked). It also disappears at tim[illegible], as in Lat. *sacramentum*, oath, Fr. *serment*; [illegible] *lacryma*, a tear, Fr. *larme*. Lastly, the same fate awaits it when flanked on either side by vowels: compare the Latin *locus*, *jocus*, *focus*, *paucum*, *vices*, *apicula*, *corbicula*, *oculus*, *nocere*, &c., with the French *lieu*, *jeu*, *feu*, *peu*, *fois*, *abeille*, *corbeille*, *oeil*, *nuire*, &c.

C is the Latin symbol for a hundred. Whether it is so used as being the first letter of *centum*, a hundred, [illegible] doubted. [NUMERALS.]

C (in music), the first note of the diatonic scale, answering to the *do* of the Italians, and the *ut* of the French. It gives a name to the natural major mode; *i.e.* that mode or key, in which no sharps or flats are employed. It is also the mark of common, or four-crotchet, time; and when a bar is perpendicularly drawn through it, *alla-breve* time is indicated. (ALLA BREVE). This letter is likewise used as the abbreviation of *Countertenor*, or *Contr'alto*.

CAAMA. [ANTELOPE, Species 62. See also Species 63.]

CABAL is often applied to a set of persons too insignificant in point of number to form a party who endeavour to effect their purposes by underhand means. The ministers of Charles II., Clifford, Ashley, Buckingham, Arlington, and Lauderdale, the initials of whose names happen to form the word cabal, were appropriately called the 'Cabal Ministry.' The character of these ministers is given by Hume in his 'History of England,' reign Charles II. The word 'cabal' appears to come from the French *cabale*, a term employed to express a number of persons acting in concert; and it is generally understood in a bad sense. (Richelet.) We are not aware that it was used in our language before the time of Dryden.

CABANIS, PIERRE JEAN GEORGE, a distinguished physician and philosopher, the son of Jean Baptiste Cabanis, an able agriculturist, was born at Conac in 1757. His natural disposition appears to have been somewhat violent, and the earlier period of his youth was passed in continual struggles against the severity of the treatment which he seems to have received both from his father and his teachers. During a short interval, in which he was under the care of a kind and judicious instructor, he indicated a decided taste for classical literature; but being soon removed from a teacher who saw and endeavoured to develop his latent talents, and being again subjected to harshness, he lapsed into such a state of idleness and obstinacy, that at the age of fourteen his father in absolute despair sent him alone to Paris, where, feeling he had no sort of influence over him, he abandoned him to his own course. The moment he felt himself free, this youth, hitherto so indolent and intractable, became a diligent student, and for the space of two years devoted himself with an intensity which has been rarely exceeded to the study not only of the Greek, Latin, and French classics, but also of the works of the metaphysical writers both of England and France. His love of poetry was ardent, and he soon acquired no inconsiderable celebrity for some poetical pieces of his own; but seeing nothing cheering in the prospect of the pursuit of literature as a profession, he chose the study of medicine chiefly, as he himself states, on account of the varied sciences to which it obliged him to direct his attention. Under the guidance of a friend, an able physician, he applied himself for six years to the study of medicine with so much intensity that his health began to fail him, and being on this account obliged to leave Paris, he went to reside at Auteuil, where he became acquainted with the widow of Helvetius. This acquaintance determined the character of his future life. At the house of this lady, who in a manner adopted him as her son, he became intimate with the most celebrated men of that age, Turgot, D'Holbach, Franklin, Jefferson, Condillac, and Thomas. Here too he lived familiarly for many years with Diderot and D'Alembert, and occasionally saw Voltaire. He appears to have formed a strong attachment to Mirabeau, for which he was exposed to no little obloquy; he was the chosen friend of Condorcet, and he had the gratification of being able to sooth the last moments of both these remarkable men. He married Charlotte Grouchy, sister of General Grouchy and of Madame Condorcet, with whom he lived happily until his death, which happened somewhat suddenly on the 5th of May, 1808, in the 52nd year of his age. He had borne no inconsiderable part in the events of the Revolution; was one of the Council of [illegible] Hundred, and afterwards a member of the Senate. He [illegible] the author of several works of great celebrity in his day, but that which has given his name a permanent distinction is his treatise on the relation between the physical and moral nature of man. This work, entitled 'Rapports du Physique et du Moral de l'Homme,' is partly metaphysical and partly physiological, and displays no ordinary power of observation and analysis. It is remarkable too as being the first attempt to treat, in a systematic form, the interesting but difficult subject which it investigates. This work may still be read with interest and instruction by the physician, the metaphysician, and the practical educat[illegible]

CABASSOU, or KABASSOU. [illegible]LO, Section II.

CABBAGE. There are several species of the genus *brassica*, or cabbage, which comprehends the *turnip*, the *rape*, the *cole*, and the common culinary cabbage, or *brassica oleracea*. The innumerable varieties arise from difference of soil and cultivation; and as all the cabbage tribe form hybrids, new varieties are continually produced. This is effected by the bees, when different sorts are in flower at the same time. The pollen adheres to their body as they seek honey in the flowers, and being deposited on the pistils of other sorts, impregnates the germen. Hence only one variety of cabbage should be in flower at the same time in any garden or field, when we wish to keep the sort unadulterated; particularly if some sorts have expanded leaves, and others close heads. It is thus only that the excellent small miniature cabbage, which grows on the stem of the Brussels' sprout, can be kept in perfection. The different sorts of cabbages most prized for the garden are chiefly divided into the close-hearting and the spreading. Of the first, the York and the Savoys are the most common; of the latter, the cole-worts and Scotch kale.

In order to have a regular succession of cabbages the seed should be sown at different times, from the beginning of spring to the autumn. The early sown will run to seed the same year; the later sown will increase more, produce larger and firmer heads, and will not go to seed till the next [illegible] Some sorts, it is said, will continue to produce leaves [illegible] several years, if they are regularly taken off, and if the [illegible] stem is prevented from shooting by cutting it down as soon as it begins to appear. Thus a perennial cabbage-tree is produced, which yields abundance of food for sheep and cattle.

Cabbage plants are generally raised first in a seed-bed when they are intended for early produce they are sown before winter, and protected by shelter, or under glass frames. In this manner strong plants may be had early in spring, which planted out in April will produce fine cabbages by July or August. Those which are raised on a large scale are generally sown in March, and planted where they are to remain in June or July. When they have been pricked out from the seed-bed very young, and allowed [illegible] get to a good size in a piece of ground prepared for the purpose before being finally transplanted in the field, the success is more certain, and it will well repay the additional trouble. These come to perfection in autumn, and may be taken off the ground as they are wanted. Some kinds are so hardy that they will bear the severest frosts, and remain covered with snow for a considerable time without damage. Such are the green curly-leaved cabbages, or Scotch kale, which form no close head, but consist of spreading leaves. The great portion of nutritive matter in the leaves and stems of cabbages has made them an important object of cultivation wherever much cattle is kept, and where the land is favourable to their growth.

The cultivation of cabbages is the same in the field as in the garden, except that on a large scale less attention is paid to each plant, and the spade is superseded by the plough, and other instruments. A good and rather stiff loam is best adapted to cabbages. They require a considerable portion of manure if the land is not naturally rich, or if they are cultivated as a part of a regular rotation. There is no vegetable which produces so large a portion of food for cattle on the same space as the cabbage, provided the soil suits its growth. Though it impoverishes the ground, this should not prevent its being extensively cultivated, provided the nourishment it produces compensates for the additional manure required. The great advantage in the cultivation of the cabbage is, that a great portion of its substance is restored to the ground in all well-regulated establishments, in the shape of the dung [illegible] of the cattle fed upon them. It is asserted by experienced agriculturists that in this respect it is superior to the common turnip. The cultivation of the cabbage on a large scale is by no means so general on the soils well adapted to [illegible] as might be wished. This is probably owing to the trouble of transplanting, and the occasional failure of the plants in very dry weather. But the trouble and expense may be greatly diminished by attention and method. The plants may be raised in such abundance, by having a regular garden for the purpose, that they may be transplanted at various times, and the plants placed so thick as to allow for failures, whilst those which are superfluous may [illegible] out. The cause of failure is generally in the careless manner of planting. Holes are usually made in the ground with some blunt instrument, the plants are put in without its being noticed whether the roots are doubled up or straight, whether the earth is pressed close to the roots, or vacancies are left between them and the soil, in which case they cannot take root properly. The ground having been well prepared, and being in good heart and tilth, the plough should open a deep and narrow furrow. The plants having been carefully taken up without breaking the fibres of the root, the tops should be cut off to about six inches from the crown, women and children should then go along the furrow with baskets in which the plants are carefully laid, and place them, at the distance of eighteen inches or two feet from each other, against the earth which has been just turned over by the plough, so that the bottom of the roots shall lie along the newly-made ridge, and the crown of the plant be on a level with the surface of the ground; a slight push will make it adhere to the fresh soil. If some rich mould is mixed with drainings of the dung-hill or ditch water to the consistency of soft mud, and the root of each plant is dipped in a pail of this mixture immediately before planting, the plants will seldom fail. The plough in returning covers all these roots with the earth of the next furrow; and a man follows and presses his foot obliquely st the furrow slice at the place where the head of the ppears. The plough then takes two shallower and er furrows, or leaves a space of two feet between the last-made furrow, and forms another in which plants are again placed and covered up as before. The rows will thus be three feet wide. If the cabbages are of a large sort every alternate plant may afterwards be cut out, either as soon as they are fairly rooted, or when they have acquired a moderate size; in which case they will afford excellent food for cows and pigs, although not sufficient to stall cattle upon. The repeated use of the plough and horse-hoe between the rows is necessary for the growth of the cabbages, as well as highly useful to clean the land. By this mode of cultivation much labour is saved, the risk of the failure of the plants is greatly diminished, and if the ground has been well prepared and sufficiently manured, an astonishing weight of solid food for cattle is obtained. The best [illegible] to plant in the field is the large red, or the Scotch drum-head cabbage. Should the ground be of great fertility, and at the same time compact, the large Strasburg cabbage, which grows to the weight of 60 and even 80 lbs., will produce an enormous weight of food. This cabbage is common in Germany.

When given to cattle or sheep, cabbages should be sliced in the same manner as turnips or beet-root. When milch cows are fed with them, all the decayed leaves should carefully taken off and given to store cattle or pigs; f these are the chief cause of the bad taste which the milk and butter acquire from this food. [Butter.] For bullocks cabbages and oil-cake are excellent food, and increase their flesh rapidly. For sheep they should be sliced and given to them in troughs in the field where the cabbages grow, or on grass-land which requires to be manured. In England the sorts which have a close head are preferred; but where labour is abundant and forage scarce, as in France, the branching sorts are thought more profitable, because the leaves may be taken off repeatedly and will grow again. The thousand-headed cabbage, and the large cabbage of Poitou, as well as the tall cabbage, called *chou cavalier*, which grows with a stem six feet high, and gives large broad leaves without any close head, are greatly preferred in France to the sorts which bear close heads.

Cabbages are subject to a peculiar disease when repeatedly planted in the same ground: the bottom of the stem enlarges, and the plant becomes This disease is called *clubbing*, and is occasioned by an insect, which deposits its eggs in the substance of the stem where it joins the root: the organization of the plant is deranged, and the cabbages never come to perfection. The only remedy for this disease is to change the cultivation, and for a time to plant no cabbages on the ground which produces clubbed plants, but to trench it up well, and expose it to the winter's frost in ridges: quick-lime should be put on it, but no manure; and other vegetables of a different class should be sown for two or three years. After this it may be considered as purified, and cabbages may safely be planted there again. In the fields, where cabbages do not return so frequently on the same ground, this disease is seldom found. The depredations of caterpillars and slugs are sometimes very great; the only means of prevention is to pick them off as soon as they appear; ducks and fowls in this case are excellent helps, the former especially, for clearing the ground of slugs.

In Germany there is an immense consumption of the large white cabbage in the form of the national mess, called *saur kraut*. This is prepared in the following manner:—the cabbages are sliced thin by hand, or by a machine like a turnip-slicer, of the same kind as that by which French beans are sliced in Holland. [B[illegible], p. 83.] The bottom of a cask, of which the head has been taken out, is covered with salt, and a layer of thin-sliced cabbage six inches thick is laid over it; on this a quantity of salt is spread, and another layer of cabbage mixed with some juniper-berries and whole pepper; and thus salt and cabbage alternately until the cask is filled. A round board is then put into the cask so as nearly to fit it, and on this a heavy weight of stone or metal is laid. As the cabbage ferments and sinks, the cask is filled up with fresh salt and cabbage. After some time the expressed juice is poured off, some water with salt dissolved in it is poured over, and changed until it ceases to rise with a scum and fœtid smell; the cabbage is then in a fit state to be kept. A cloth is laid over it, and over this the round board and weights. When any portion is taken out for use, a sufficient portion of brine is allowed to remain over the mass to exclude the air; and the cloth, board, and weights are replaced as long as any cabbage remains. This *saur kraut*, when washed with soft water and stewed with bacon or salted meat, is a very wholesome dish, and much relished by those who have been early accustomed to it. In long voyages it has been found to be an admirable preservative against the sea-scurvy.

CABBAGE PALM. [Areca.]

CA'BBALA. 'The Jewish Cabbala,' says Dr. Henry More in the preface to his 'Conjectura Cabbalistica,' 'is conceived to be a traditional doctrine or exposition of the Pentateuch, which Moses received from the mouth of God while he was on the mount with him. And this sense, or interpretation, of the law or Pentateuch, as it is a doctrine received by Moses first, and then from him by Joshua, and from Joshua by the seventy elders, and so on, was called *Cabbala* from קִבֵּל, *kibbel, to receive.* But, as it was delivered as well as received, it was called *Masora*, which signifies a *Tradition*; though this latter more properly respects that critical and grammatical skill of the learned among the Jews, and therefore was profitable for the explaining the literal sense, as well as that more mysterious meaning of the text where it was intended.' In a wider sense, however, the Cabbala is used for the whole secret or esoteric philosophy of the Jewish doctors—a subject of great extent and intricacy, upon which voluminous works have been produced both by Rabbinical and Christian writers. The most celebrated collection of the Rabbinical writings on the Cabbala is the work entitled 'Kabbala Denudata, seu Doctrina Hebræorum Transcendentalis,' &c., 3 vols. 4to. Sulzbach, 1677, and Frankfort, 1684. The editor of this work, which is a very rare book, the third volume in particular, is believed to be Christianus Knorrius à Rosenroth. Lists of the Rabbinical treatises on the Cabbala may be found in Wolf's 'Bibliotheca Hebræa,' and in the 'Bibliotheca' Magna 'Rabbinica' of Bartoloccius and Imbonatus. Of the Christian writers on the Cabbala, the most famous are Picus of Mirandola the younger, Van Helmont, and his friend Dr. Henry More, the learned and eloquent English Platonist. Dr. More, under the title of 'Conjectura Cabbalistica,' published what he calls 'A conjectural Essay of interpreting the mind of Moses in the three first chapters of Genesis, according to a threefold Cabbala, viz.: literal, philosophical, mystical, or divinely moral.' This work, which, with the defences, appendices, &c., in the edition of 1713, fills about 250 folio pages, is a very remarkable performance. So highly does the pious writer estimate the secret philosophy which he thinks may be extracted from the Mosaic records, and so essential does he deem it to the right understanding of scripture, that in his dedication to Dr. Cudworth, he does not hesitate to affirm that if the atheist could have fully granted to him 'that there is no knowledge of God but what Moses his text set on foot in the world, or what is traditional, he cannot but think that religion in this dress is so empty, exceptionable, and contemptible, that it is but just, with as many as are not mere fools, to look upon it as some melancholic conceit, or cunning fiction, brought into the world to awe the simple sort, but behind the hangings to be freely laughed at and derided by those that are more wise, and that it were an easy thing in a short time to raze the memory of it out of the minds of men, it having so little root in the human faculties.' There is a valuable article on the Cabbala, by the Abbé Mallet, in the great French 'Encyclopédie.' A short popular account of this philosophy is given by the Marquis Le Gendre in the 7th chapter of the third book of his 'Traité de l'Opinion.' The celebrated work of the Abbé de Villars, entitled 'Le Comte de Gabalis,' from which Pope avows that he took the machinery of Sylphs and Gnomes in his 'Rape of the Lock,' is a satire upon the mystical absurdities of the Jewish Cabbala. Bayle has noticed that the substance of this work is contained in the first two of ten letters attributed to the charlatan Joseph Francis Borri, and published at Geneva in 1681, under the title of his 'Chiave del Gabinetto' (Key of the Cabinet) (Art. Borri, note G.) Although the letters in question are dated at Copenhagen in 1666, there can be little doubt that they were stolen from the work of the Abbé de Villars, which was first printed in 1670.

CABELLO. [Puerto Cabello.]

CABES, GULF OF, the Syrtis Minor of the antients, lies between the W. coast of the regency of Tripoli and the E. coast of that of Tunis. It takes its name from the town of Cabes or Ghabs, situated at the bottom of the gulf, and near the border of the two states. The fine island of Gerbi, with 30,000 inh., is in the E. part of the Gulf of Cabes on the Tripoli coast though dependent on Tunis, and the town and port of Sfax in the Tunisian mainland is on the opposite or N.W. coast. The Gulf of Cabes is bounded to the N. by the Cape Capoudia and the Kerkeni islands or rocks, which divide it from the Gulf of Hammamet, which extends northwards towards Cape Bon.

CABIÄI. [Capybara.]

CABIN, a term in naval architecture, applied to those portions of a ship allotted to the various officers. In large vessels the admiral's and captain's cabins extend across the ship near her stern, and they are usually divided into two, termed the *fore* and *after* cabins; the latter are considered more strictly private, while the former are used for dinner, for the reception of strangers, and other purposes. Those belonging to the junior commissioned and warrant officers are ranged along the side of the ship, having an area of from five to six feet in width, and from six to seven feet in length.

In frigates the captain's cabin is on the main deck, and the gun-room, or after part of the lower deck, is given to the officers; but in two-decked line-of-battle ships, the captain takes the cabin under the poop, and the officers the great cabin on the upper gun-deck, which is called the ward room, and along the sides of which is a row of private cabins (each containing a port, and therefore a gun), while the central space is left undivided for a mess-place. In three-deckers, this large apartment is appropriated to the admiral, and the officers take the corresponding one on the middle gun-deck. The partitions by which all these cabins are enclosed are called *bulk-heads*, and are composed of light panelled frames, which are instantly removable when the decks are ordered to be cleared for action.

CABINET, a word which is extensively employed in the French language, but has a much more limited signification in this country. In France, an apartment in which men of business transact their private affairs and barristers receive their clients is called a cabinet. Hence the application of the word to the council chosen by kings to advise with them on the course of public affairs and to direct the higher branches of the administration. The members of the executive government in England who are responsible for public measures are, as a body, termed the Cabinet, and as individuals, Members of the Cabinet.

CAB'IRI (Κάβειροι), antient Pel [illegible] ities, belonging to a system of elementary religio [illegible], in the later ages of Greece, was connected with th [illegible] tion of mysterious rites in the island of Samothrace. According to Strabo (p. 472), who quotes Stesimbrotus, they derived their name from Mount Cabeirus in Berecynthia. They were apparently the same as the Corybantes, &c. (Strabo, p. 466, 472; *Schol. on* Aristoph. *Pac.* 277), and their worship was most cultivated in Samothrace, Lemnos, Imbros, and certain towns of Troas. (Strabo, p. 473.) Their names were mystical, and are given by Mnaseas. (*Schol.* Apoll. Rh. i., 917.) Camilus, Cumilus or Cadmilus, was the son of Hephæstus and Cabeira, and his children were the three Cabeiri, from whom came the nymphs Cabeirades (Acusilaus, *ap.* Strab., p. 472). Camilus is stated to have been the same as Hermes, and the three Cabeiri mentioned by Mnaseas, Axieros, Axiocersa and Axiocersus, are said to correspond to Ceres, Proserpine and Pluto respectively. It seems more probable, however, that Camilus represented the generative principle (Herod. ii. 51,) and that the three Cabeiri were personifications of Love, the male and the female, the first part of each name being the epithet ἄξιος (worthy) which is very frequently applied to gods, and the remaining parts, Eros, Kersos and Kersa, having the significations which we have assigned to them. (*κέρσης, γάμος.* Hesych.) The reader who is desirous of investigating this antient religion may consult Creuzer's *Symbolik* (ii. p. 318.): Müller's *Orchom.* (p. 450.): Welcker's *Trilogie*, Lobeck's *Aglaoph.* (lib. iii. c. 6), and Schelling's *Treatise on the Samothracian Mysteries.* The images of the Cabiri were pygmy statues, of which there are specimens among the terra-cottas of the British Museum (Combe, no. 42). As the son of Vulcan, Cabeirus or Cadmilus is represented with a hammer in his hand. (Winckelmann, ii. p. 507.)

CABLE. [Rope.]

CABLE, CHAIN. [Chain Cable.]

CABOT, SEBASTIAN. The accounts of this great navigator have till recently been clouded by the greatest obscurity. A Memoir of Cabot, published in London in 1831, has at last put the facts of his life in a clearer light, and removed much of the uncertainty. After a careful consideration of the arguments in this memoir, we have adopted nearly all its conclusions.

Sebastian Cabot was the son of John Cabot or Gabotto, a native of Venice, who resided occasionally in England, and of whom little more is known than that he was a wealthy, intelligent merchant, and fond of maritime discovery. Sebastian was born at Bristol about 1477, and was early instructed in geography, navigation, and mathematics. When only 19 years of age, he was included with his two brothers in a patent, dated 5th of March, 1496, granted by Henry VII. to John Cabot his father, for the discovery and conquest of unknown lands. About a year after the date of the patent, Sebastian Cabot sailed (apparently with his father) in a ship equipped at Bristol, named the Matthew, and on the 24th of June he first saw North America, probably the coast of Labrador, about lat. 56°. It has generally been stated that this first-discovered land was Newfoundland, and that it was named by Cabot Prima Vista; but it appears that the cause of the error was a mistranslation by Hakluyt of a document in Latin appended to a map of America drawn by Cabot himself. The description given in that document cannot possibly refer to Newfoundland, but may apply very well to the coast of Labrador. We have no account of this voyage further than the discovery itself, but it appears probable that Cabot returned to England immediately: an opinion which receives some support from an entry in the privy purse expenses of Henry VII.,—'10th August 1497 To hym that found the new Isle 10*l*.' This is still further confirmed by the recent discovery of an original patent of 3rd of February, 1498, granting to John Kabotto permission to take six ships in any haven of the realm, of the burden of 200 tons and under, 'to convey and lede to the Londe and Isles of late founde by the seid John in oure name and by our commaundemente,' &c. The date of this last patent and its general purport have been long known, but it has been usually supposed to be simply intended to further the object of the first patent, in consequence of difficulties experienced in fitting out ships; and an error in date has been suspected in order to make it tally with the supposition. It is difficult to assign to each of the Cabots (a father and three sons) his exact part in these discoveries, but Sebastian seems always to have been considered the most scientific navigator of the family. Another voyage was made by Cabot, according to the terms of this patent, but we have no details as to its result; and a third voyage appears to have been made to the Gulf of Mexico in 1499. About this time it is supposed that John Cabot died, but there is no record of his death, nor is anything whatever known of Sebastian Cabot for the next twelve years. Soon after the death of Henry VII. Cabot was sent for by Ferdinand king of Spain, in which country he arrived in September, 1512, and immediately received the title of Captain, with a liberal salary. It appears from Spanish authorities, that Cabot was disgusted with the want of consideration shown him in England. No specific duties appear to have been at first assigned to Cabot in Spain, but we find him in 1515 connected with a general revision of maps and charts, and holding the dignified station of member of the council of the Indies. He was also appointed to conduct an important expedition for making new discoveries towards the west; but the death of Ferdinand, in the beginning of 1516, prevented the accomplishment of the plan. The new king of Spain, Charles V., was occupied elsewhere, and did not reach Spain for some time, during which the court was a scene of shameless intrigue. Fonseca, the enemy of Columbus, was in authority, and the slights he and his creatures put upon Cabot caused his return to England. In 1517 he was employed by Henry VIII., in connexion with Sir Thomas Perte, to make another attempt at a north-west passage. It appears that on this voyage reached lat. 67½°, and it must have been on this occasion that he entered Hudson's Bay, 'and gave English names to sundry places therein.' But of this, like all the rest of Cabot's discoveries, no details have been preserved, and even the whole voyage has been referred to the south instead of the north. It is only known that the malice or timidity of Sir Thomas Perte, and the mutinous conduct of his crew, compelled him to return. After this voyage Cabot again visited Spain, where he was named by Charles V. Pilot Major of the kingdom, and intrusted with the duty of critically examining all projects of voyages of discovery. At this time the views of adventurers were chiefly directed to the south, and the Molucca Islands were pointed out as a valuable field for enterprise. Portugal having earnestly represented that the limits assigned to her by the pope in his division of the New World would include the Moluccas, it was resolved that a solemn conference should take place, in which all parties should state their claims, and experienced men should attend for the purpose of reference. Cabot is at the head of this list, in which we also find Ferdinand Columbus, son of the great Columbus. The conference was held at Badajoz, in April, 1524, and by the end of May sentence was pronounced that the Moluccas were within the Spanish division of the world. The Portuguese retired in disgust, talking of preparing an expedition to destroy any Spanish or other vessel which should venture to trade within the disputed territory. Immediately after the decision, a company was formed at Seville to prosecute the trade to the Moluccas, and Cabot was solicited to take the command. By an unfortunate selection, the persons who were put in command immediately under Cabot were personally hostile to him. The expedition sailed in April, 1526, and proceeded to cross the Atlantic. On the Brazilian coast a daring mutiny, excited by his officers, compelled him to resort to the extremity of putting on shore the three ringleaders, who were actually the persons named to succeed him in command in case of his death. Cabot explored the river La Plata and some of its tributaries, erected forts in the most favourable positions, and endeavoured to colonize the country. He dispatched persons to Spain to solicit the permission of the Emperor Charles, and a supply of ammunition, provisions, &c.; and as the merchants declined to co-operate in the new undertaking, Charles took the whole expense upon himself.

About 1527 Diego Garcia, commander of a rival expedition, arrived in the Plata, ascended the Parana, and had an interview with Cabot. Garcia claimed the discovery of the Plata river as being under orders from Charles V.; and Cabot, who would not struggle for a doubtful right, descended the river with him. Garcia soon after quitted the country, but left behind him some of his followers, who were guilty of acts which roused the fierce resentment of the Guaranis, but in which it is expressly declared by Herrera that Cabot took no part. The vengeance of the natives knew no distinctions; the whole nation burst with fury on the feeble colony, and Cabot was compelled to put to sea. He returned to Spain in 1531, where he resumed his old office, and is known to have made several voyages. In 1548 he resolved to return to his native country.

Edward VI. was then on the throne of England, and being very solicitous about maritime affairs, he appears to have conversed with Cabot, and to have received from him some explanation about the variation of the compass, first noticed, or at least first particularly attended to, by Sebastian Cabot. In the beginning of 1549 Edward granted him a pension of 250 marks per annum (166*l.* 13*s.* 4*d.*). Cabot remained high in the king's favour, and was consulted in all affairs relating to trade and navigation. The advice and influence of Cabot in directing an expedition to the north, opened to England the valuable trade with Russia: he was made governor of the company of merchant adventurers by whom the expedition was fitted out; and the instructions delivered by him to the commander, Sir Hugh Willoughby, reflect the greatest credit on his good sense, knowledge, and humanity.

After the Russia trade was established, the exertions of Cabot were continued: the journal of Stephen Burroughs, who was dispatched as commander of a vessel in 1556, shows the character of Cabot in a favourable light. Speaking of a visit to the vessel at Gravesend, previous to her departure, he says, 'the good olde gentleman, Master Cabota, gave to the poore most liberall almes, wishing them to pray for the good fortune and prosperous successe of the Serchthrift, our Pinnesse?' and at an entertainment afterwards,—'for very joy that he had to see the towardness of our intended discovery, he entered into the dance himselfe amongst the rest of the young and lusty company.'

The death of Edward VI. and the succession of Mary put an end to the enterprise of Cabot. His pension was continued until May, 1557, when it was renewed, not to him exclusively, but jointly with one William Worthington, of whom little is known. To this person all the maps and documents of Cabot were delivered, and it has been supposed that by his means they were either destroyed or put into the possession of Philip of Spain, the husband of Mary; certain it is that they are no longer to be found.

It is not known when or where Cabot died; although his friend Eden, in his dedication to the translation of 'Taisnierus' Treatise on Navigation,' gives an account of his death. He says, speaking of a mode of finding the longitude, 'Cabot, on his death-bed, tolde me that he had the knowledge thereof, by divine revelation, yet so that he might not teache any man.' Eden thought 'the good old man in that extreme age somewhat doted, and had not yet, even in the article of death, utterly shaken off all worldlye vaine glorye.' (*Memoir*, p. 223; see also Hakluyt, Purchas, Cooley, and Anderson's *History of Commerce.*)

CABRAL. [BRAZIL, vol. v., p. 369.]

CABRE'RA (the antient Caprária), a small island of the Balearic group, S. of Majorca, and about 10 miles from its southernmost point, Cape Salinas. It is about 4 miles long and 3 broad, is rocky and barren, and only frequented by fishermen. During the war of the Spaniards against Napoleon, Cabrera was the place of confinement of several thousand French prisoners who were taken by the Spaniards in Catalonia and other parts of Eastern Spain. It was an abode wretched enough, though in some respects preferable to a walled prison or a hulk. The prisoners were left to themselves, without any guards, and had the whole range of the island, from which they could not escape. An allowance of bread was sent to them in a vessel from Majorca, but at times, in consequence of bad weather, the prisoners were in danger of being starved. Some lived in dry cisterns or caves, others in bivouacks or huts made of loose stones, as there appears to have been no building of any sort on the island. French ingenuity contrived to make the best of the matter. The prisoners formed little gardens, and established schools for mathematics, drawing, music, dancing, and fencing; they even established a theatre in a large [illegible]n. During several years they received no clothing, and consequently were almost naked. They had but one axe and one saw among them all: the Spaniards left them one donkey for their use. The account of their mode of living forms a very interesting picture. (*Adventures of a French Serjeant*, London, 1826.)

CABUL, or CAUBUL. [AFGANISTAN, vol. i. p. 169.]

CABUL, or CABULISTAN. [BELOOCHISTAN, vol. iv. p. 198.]

CACAO, or, as it is commonly called, Cocoa, is the bruised seeds of the theobroma cacao, a tree belonging to the natural order Sterculiaceæ. The seeds are oval, about as large as an olive, obtuse at each end, compressed, and covered with a violet or ash-grey skin, which encloses two irregularly-cut and plaited cotyledons, of a fatty nature, and of a brownish-black or violet-colour. The properties of these seeds are owing to the presence of a fixed concrete oil and an agreeable aromatic principle. Simply bruised they constitute the cocoa of the shops; reduced to a paste, mixed with sugar and flavoured with vanilla, they become chocolate. They are imported from several of the West India islands, from Caracas, from Guayaquil, from Brazil, in all which places the tree grows wild, or is cultivated for the sake of its seeds. It has been estimated by Humboldt that the consumption of cacao in Europe was, in 1806, 23,000,000 lbs. For a description of the tree and its mode of culture see THEOBROMA.

The quantities of cacao imported into, re-exported from, and consumed in this country in each of the five years from 1831 to 1835, were—

	Imported.	Re-exported.	Consumed
1831	3,48[illegible],118 lbs.	1,531,131 lbs.	502,806 lbs.
1832	2,971,019	1,798,264	1,150,1[illegible]
1833	4,608,718	2,351,877	1,268,287
1834	2,984,894	2,205,316	1,173,795
1835	2,088,952	2,481,133	1,085,980

The great increase in the consumption between 1831 and 1832 was occasioned by the reduction of the duty in the latter year from sixpence to twopence per pound.

CA'CERES (Castra Cæcilia, Castrum Cæsaris, and Casa Cereris), a town of the Vectones or Vettones, in antient Lusitania, was till lately the capital of the district (partido), and is now that of the province of its name in Estremadura. It is reduced to 10,000 inhabitants (half the number it had before the dismemberment of Portugal), and to some 30 fine houses; but it has still many more large houses, besides a new court of justice (audiencia), an hotel de ville, a public seminary, an asylum for invalids and orphans, and a few manufactories. It possesses numerous inscriptions and other Roman antiquities, mentioned by Ponz (*Viage de España*,) and by Laborde (*Voyage Pittoresque d'Espagne*, vol. ii.); and moreover interesting ruins had been discovered about 300 yards from the town, and also at Aldehuela and the hermitage of St. Otalla. It enjoys the best climate of Estremadura, with abundant and excellent springs, united to a rich soil, chiefly appropriated to pasture for oxen and sheep. Caceres is noted for its fine Merino wool.

Caceres is in 39° 25′ N. lat., 6° 15′ W. long., and 146 miles W. S. W. of Madrid.

CACHAR, a province in the N.E. quarter of Hindustan, bounded on the N. by the Brahmapootra river and Asam; on the E. by Munipoore and the Burmese territory; on the S. by Silhet and Tiperah; and on the W. by the principality of Gentiah. This province is situated between 24° and 27° N. lat., and between 92° and 94° E. long.: its length from N. to S. is about 140 English miles, and its breadth from E. to W. about 100 miles.

The antient name of Cachar was Hairumbo. The province comprehends two divisions, Cachar Proper and Dharmapore; the first occupying the S. and the second the N. part of the province. The country in general is mountainous; to the N. is a branch of the Garrow mountains; in the S. and S.E. is a continuation of the hills of Tiperah, which stretch to the N. as far as Cospore, the capital of the province, where they turn abruptly to the W. to meet the Brahmapootra. The height of these hills varies from 600 to 1000 feet; the west slope is very rapid, and even precipitous. The Bhavani mountains are about 40 miles S.E. of Cospore. The greater part of the mountains are covered with forest trees, bamboos, and jungle, which frequently render them inaccessible; the passes over them are not practicable at all seasons, and these natural difficulties have not been removed by the construction of roads.

A great number of small streams have their sources in the high lands of Cachar. Those in the eastern mountains unite and form the rivers Capili and Barak, both of which join the Megna or Brahmapootra; the Barak at the point (lat. 24° long. 91°) where th[illegible] name of the Megna. At certain seasons [illegible] Barak can be navigated; in the dry sea[illegible] the channel is obstructed by rocks; but so[illegible]son has set in, the river has a depth of from 30 to 4[illegible] of water. From June until November, cons[illegible] inundated, and the [illegible]ty of travelling is consequently [illegible].

The jungle fever, a disease often fatal to Europeans, is common in Cachar, owing doubtless to the uncleared state of the country and the frequent occurrence of stagnant water. This disease, however, does not appear to be hurtful to the natives, who are described as being strong and healthy in appearance. The Cacharies are of fairer complexion than the Bengalese, and more resemble Chinese in their cast of countenance. The country is thinly inhabited. The entire population has been estimated at 80,[illegible] families, or about 360,000 individuals, but this estimate [illegible] to be in excess. The best peopled districts are those nearest to the S.W., and a level tract in the N. near to the Capili river and adjacent to the town of Dharmapore.

Cospore, the modern capital, is 20 miles S. of Grobange, the antient capital of Hairumbo, in 24° 45′ N. lat., and 92° 45′ E. long., and on the banks of a small stream called the Madhura. The rajah of Cachar having, in 1811, removed his residence to Doodputlee, a small town about 18 miles farther N., Cospore has since gone much to decay. The town of Dharmapore, in the northern division of the province, and about 60 miles from Cospore, was formerly a place of some strength, and enjoyed a considerable trade, but the fort has now fallen into decay, the trade has in a great measure left the place, and its population has decreased. In the time of its prosperity the revenue derived from this town was greater than that from all the remaining parts of the province.

Cachar was invaded by the Burmese in 1774, but the force first sent was destroyed by the jungle fever. A second expedition reduced the rajah to submission, and forced him to become a tributary of the king of Ava. The rajah of Cachar was summoned to Ava in 1810, but he refused to go, and the Burmese monarch sent a force against him. Finding himself unable to resist, the rajah placed his territory under British protection, but having immediately after been deposed, his successor refused to abide by the treaty that had been drawn up. This usurper having been in his turn displaced, a British detachment entered Cachar and expelled the Burmese, whom they forced to renounce all pretensions to sovereignty in the province. In return for the protection thus given, the rajah agreed to pay to the English government an annual tribute of 10,000 rupees.

(Hamilton's *East India Gazetteer*; *Report of Committee of House of Commons on the Affairs of India*, 1832.)

CACHET, LETTRES DE, were letters proceeding from and signed by the kings of France, and countersigned by a secretary of state. They were called also 'lettres closes,' or 'sealed letters,' to distinguish them from the 'lettres patentes' sealed by the great seal. Lettres de cachet were rarely employed to deprive [illegible] of their personal liberty before the seventeenth century. They were previously made use of occasionally as a means of delaying the course of justice; but during the reign of Louis XIV. they were obtained by any person who had sufficient influence with the king or his ministers, and persons were imprisoned for life, or for a long period, on the most frivolous pretexts, for the gratification of private pique or revenge. The terms of a lettre de cachet were as follows:—'M. le Marquis de Launay, je vous fais cette lettre pour vous dire de recevoir dans mon château de la Bastille le Sieur ———, et de l'y retenir jusqu'à nouvel ordre de ma part. Sur ce, je prie Dieu qu'il vous ait, M. le Marquis de Launay, en sa sainte garde.' These letters, giving power over personal liberty, were openly sold in the reign of Louis XV. by the mistress of one of the ministers. The lettres de cachet were also granted by the king for the purpose of shielding his favourites or their friends from the consequences of their crimes; and thus were as pernicious in their operation as the protection afforded by the church to criminals in a former age. Their necessity was strongly maintained by the great families, as they were by them enabled to remove such of their connexions as had acted in a derogatory manner. During the contentions of the Mirabeau family, 59 lettres de cachet were issued on the demand of one or other of its members. The independent members of the parliaments and [illegible] magistracy were proscribed and punished by [illegible] of these warrants. This monstrous evil was swept away at the Revolution, after Louis XVI. had in vain endeavoured to remedy it

(Mirabeau, *Des Lettres de Cachet*, 1782; and *Translation*, published at London, in two volumes, in 1787.)

CACHICAME. [ARMADILLO, Section I.]

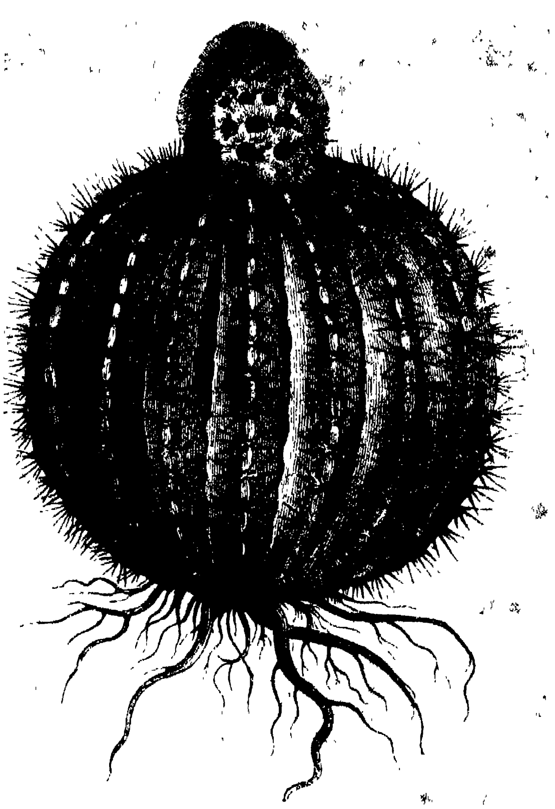
CACIQUE, a Mexican word which signifies 'lord' or master.' It was generally adopted by Spanish writers to signify the chiefs, governors, or principal personages of those American tribes with whom the Spaniards became acquainted by their conquests in the New World. (Solis, *Hist. de Nuev. Esp.* iii. 3; *Diccionario por la Real Academ. Esp.*)

CACTUS, the old name of a group of plants, once considered to form a single genus, but now, in consequence of modern discoveries, elevated to the rank of a natural order called cactaceæ or cacteæ.

The fructification of these plants consists of a calyx adhering to the ovary, with a border divided into an uncertain number of segments, which are arranged in several rows, the one overlapping the other, and the innermost gradually ceasing to be green and leafy, but acquiring the delicacy and colour of petals. The latter usually pass into sepals by insensible gradations, are very numerous, and often brilliantly coloured. The stamens originate in the orifice of the tube formed by the combination of the petals and sepals, are very numerous, and consist of delicate thread-shaped filaments terminated by small roundish anthers. The ovary, which, in consequence of its adhesion to the sepals, seems to occupy the place of the stalk of the flower, consists of a single cell, lined with parietal placentæ covered over with minute ovules; its style is slender; the stigma is star-shaped and divided into as many narrow lobes as the ovary contains placentæ. The fruit is a succulent berry, marked at the end by a broad scar formed by the separation of the limb of the calyx: it contains a great quantity of seeds, which consist of nothing but a skin containing a succulent embryo slightly two-lobed at the upper end.

In natural affinity these plants have been considered allied to the gooseberry tribe (GROSSULACEÆ) on account of the great similarity in the structure of their fruit, and in the general production of spines upon their branches. But in the opinion of others (Lindley's *Nat. Syst.*, ed. 2., 51) this is not the most correct mode of considering their relationship, which is probably far greater with Ficoideæ or Mesembryaceæ, and the other epigynous orders of polypetalous dicotyledons.

The habit of cactaceæ is remarkable. They have a very succulent stem, in which the woody system is developed in but a small proportion compared to the whole mass. Usually the stem is angular or deeply channelled, occasionally it is destitute of both angles and channels, but in that case is mostly either much compressed as in the opuntia tribe, or leafy as in the epiphylla. Sometimes it is continuous from the base to the apex, but in many instances it is divided off into regular joints, each of which [illegible] a similar form varying with the species; in these instances however it is worthy of remark that as the stems advance in age the angles fill up or the articulations disappear in consequence of the slow growth of the woody axis and the gradual development of the cellular substance; so that 'at the end of a number of years, which vary according to the species, all the branches of cactaceæ, however angular or compressed they originally may have been, become trunks that are either perfectly cylindrical or which have scarcely any visible angles. This metamorphosis is one of the causes which render it so difficult to identify species that have been described in their native localities from full-grown specimens, with such as are cultivated in the gardens of Europe.' The greater part of the species have stems which are more or less elongated, but in some they are spherical, as in the whole genera melocactus and echinocactus: whatever may be the form of the stem, they usually bear upon their surface little tubercles which at an early age lose the leaves. Those organs however rapidly fall away, and are succeeded by tufts of hairs or spines hooked backward at the ends, and then the cacti have the appearance of being perfectly leafless.



[Melocactus communis.]

All the species are believed to be natives of America, whence however some of the opuntias have been so long introduced to the old world that they have here and there taken possession of the soil, and appear like aboriginal inhabitants. Such is the case on the volcanic soil of Ætna, and in various places on the shores of the Mediterranean; and this has led to the erroneous idea entertained by Sprengel and others that the opuntia of Theophrastus was the opuntia vulgaris of modern botanists. Cacti are chiefly found in the tropical parts of America, a few species only escaping from those countries; as for example, to the southern states of North America, and to the highlands of Chili and Mendoza. They principally occur on hot dry rocks or plains where the commoner forms of vegetation could not exist, and may be considered one of the means which nature has provided for the support of man in regions where neither food nor water can be procured. Their stems are filled with an abundant insipid wholesome fluid, and their fruit is succulent and in many cases superior to that of European gooseberries. In the fevers of their native countries they are freely administered as a cooling drink; and being bruised they are esteemed a valuable means of curing ulcers. For the sake of such their uses, because of their rapid growth, and especially on account of the numerous spines with which they are armed, the opuntias, or tunas, as the Spanish Americans call them, are much planted round houses as fences, which neither man nor animals can easily break through. They are not unfrequent in the dry forest lands of Brazil, but are said never to occur in the damper parts of the country. In stature they vary greatly, many of them having small creeping stems which seem to crawl upon the ground among the dead branches of the surrounding trees, with whose grey colour their deep green shoots form a singular contrast. Others rise like candelabra, with many angular ascending arms, while a few elevate their tall and deeply channelled leafless trunks far above the stunted vegetation of the sterile regions they inhabit, reaching sometimes the height of thirty or forty feet.

To enable them to endure the excessive drought to which they are naturally exposed they are furnished with an unusually tough skin, the evaporating pores or stomates of which are few in number, and very often to all appearance merely rudimentary. This contrivance prevents their losing the scanty moisture which they collect from the burning soil, and enables them to sustain the full ardour of the brightest equinoctial sun without inconvenience, in this respect resembling the succulent fruits of Europe, such as the plum, the grape, the peach, &c., which by the absence of stomates from their tough skin are equally enabled to bear the powerful action of the bright sun that is necessary for their maturation.

These facts teach us what the points are that it is most necessary to attend to in the cultivation of the numerous species which now abound in our gardens. Their skin is so formed that perspiration takes place very slowly through it, unless under the influence of powerful stimulants, and when in a young state. It is therefore obvious that they should be sparingly watered or not watered at all during a considerable period of the year. Dry as the places usually are in which cacti naturally grow, they are periodically visited by heavy rains, which, combined with a bright light and a high temperature, force into activity even the sluggish vital powers of such plants as those under consideration. At such a time the annual growth of a cactus takes place, secretions which enable the species subsequently to form its flowers are deposited, and a general impulse is given to all the torpid energies of its constitution. But by degrees the rains moderate and finally cease, the young cuticle, which at its first formation perspired freely, becomes thicker and tougher and impermeable to moisture; what food has be obtained during the short period of growth is securely enclosed within the recesses of the stem, and when the air and earth become dry the plant is provided with the means of enduring another long period of fasting and inactivity. With the fall of rain the heat moderates, but the light to which the cacti are exposed is but little, if at all, diminished, so that the assimilation and alteration of the food contained within the stem keeps continually going on, however slowly. It is by following this natural course of events that gardeners have succeeded in bringing their cacti to that extraordinary state of beauty for which they are now conspicuous; it is by attending practically to such points in the habits of the species that we obtain the myriads of large, brilliant, red, or blush or snow-white blossoms that form the glory of our greenhouses in the spring. A cactus is placed in a damp stove, exposed to all the light that can be collected without being concentrated, and it begins to grow: it is then watered, at first gently, afterwards copiously with water holding a quantity of organizable matter (manure) in solution; this practice is continued for three months, when the quantity of moisture is diminished, and the temperature is lowered, but exposure to light is still attended to, till at last the plant sinks to rest. In this state it is kept till the season for again forcing it into growth shall have returned, when it is subjected to a repetition of the same treatment as before.

If cacti are to be propagated, their branches or joints, if they have any, are cut off, a little dried, and then placed in a hot and damp place, when they strike root immediately. Among the practical consequences, De Candolle observes, that result from the facility with which they are thus multiplied, is one which deserves to be noticed on account of its importance; viz., the manner in which the opuntia is employed to fertilize the old lavas at the foot of Ætna. As soon as a fissure is perceived a branch or joint of an opuntia is stuck in: the latter pushes out roots, which are nourished by the rain that collects round them, or by whatever dust or remains of organic matter may have collected into a little soil: these roots, once developed, insinuate themselves into the most minute crevices, expand, and finally break up the lava into mere fragments. Opuntias treated in this manner produce a great deal of fruit, which is sold as a refreshing food throughout all the towns of Sicily.

Where however the species have neither branches nor joints, as is the case with some of the melocacti and echinocacti, a different mode of propagation is had recourse to: it is then necessary to compel them to branch by artificial means. Each of the numerous tufts of spines that occupy the ridges of their stems is a bud, and is capable of being forced into a branch, if by any means the general tendency to grow at the upper extremity only is checked. This is effected either by burning the apex of the plant with a broad flat iron, or by cutting the plant across below the top, in either of which cases several of the spiny buds will gradually swell and develop themselves as little branches, which, being broken off, will strike root and become new plants.

The interest that attaches to the cultivation of these curious objects has led us to go into more than our usual details concerning them, and there is still a variety of topics not adverted to. We have only however room for some observations upon the employment of certain species of opuntia for the feeding of the cochineal insect. Upon this subject we have availed ourselves of the information contained in Professor De Candolle's important memoir upon the family of Cacti. It is probable that the cochineal insect feeds upon several species of opuntia. The least spiny kinds are usually employed, because it is most easy to collect the species from them; but this circumstance does not appear to influence the choice of the insect when left to itself. The latter seems, according to the accounts of travellers, to prefer the sorts with red flowers, and to neglect those whose blossoms are yellow; at least such is the case with the three species most extensively cultivated, viz., *Opuntia Tuna*, which seems the most employed in Peru, *O. Hernandezii*, which is the most celebrated in Mexico, and *O. cochenillifera*, the native province of which is somewhat doubtful.

Opuntia Tuna has been figured in Dillenius's 'Hortus Elthamensis,' tab. 380, and is the original of what Linnæus called Cactus Tuna: it has been since called Cactus Bonplandii by Mr. Kunth. It differs from the two following in the long whitish spines that arm it, in its very broad oval joints, its fully-expanded flower, which resembles that of O. Hernandezii, except that it is larger. This is the sort which in the Paris garden nourishes the wild cochineal: it was brought from Peru by Dombey, and according to Humboldt is in much esteem in that country as the food of a valuable sort of cochineal.

Opuntia Hernandezii has been pretty well figured for his day by Hernandez, under the vulgar Mexican name of Nopalnochetzli. Subsequently Thierry de Menonville, in his 'Journey to Guaxaca,' published a figure and description of it under the name of Nopal Sylvestre. It is chiefly cultivated in the temperate parts of New Spain bordering on the Pacific. It is clearly distinguished from the following by its expanded flower, and its stamens shorter than either the petals or the style. The joints of its stem moreover are smaller, shorter, thicker, and more regularly oval.

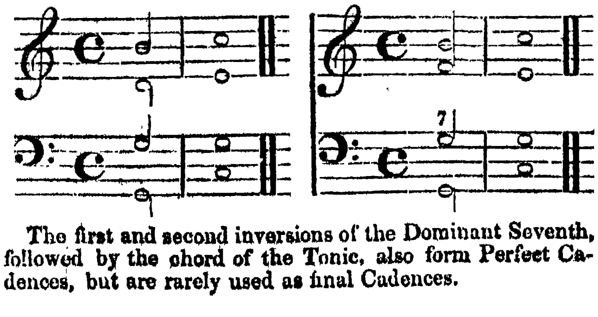
Opuntia Cochenillifera is known by the figure of Dillenius in the 'Hortus Elthamensis,' t. 297, f. 383: it has also been well represented by Sir William Hooker, in the 'Botanical Magazine,' tt. 2741 and 2742. Nevertheless, notwithstanding its name, it is the species about which there is the most doubt with regard to its feeding the cochineal. It is possible indeed that it may be the sort which Thierry de Menonville calls the Castilian Nopal, which he found in the highest estimation as food for the insect; but this is very much matter of conjecture.

CADE, JOHN, an Irishman, who pretended, and was believed by some, to be a bastard relation of the duke of York, and hence assumed the name of Mortimer. Shakspeare has made him familiarly known to us as 'Jack Cade.' The insurrection which he headed broke out in Kent in the beginning of June, during Whitsuntide week, in the year 1450, and had its origin in the wide-spread dissatisfaction occasioned by the conduct of the duke of Suffolk, the favourite and chief minister of the king. A list of their grievances was published by the insurgents, entitled 'The Complaint of the Commons of Kent.' Among other complaints alleged by the insurgents were the following: —'That people paid not for stuff and purveyance taken for the king's use; that the king's lands in France are aliened and put away fro the crown; that the people of Kent are not suffered to have free elections of knights of the shire.' In addition, Cade sent a memorial to the king, expressive of great loyalty, entitled 'The Requests by the Captain of the great Assembly in Kent,' praying him 'to take about his person his true lords, and to avoid all the false progeny and affinity of Suffolk,' and affirming that 'the realm of France, the duchies of Normandy, Gascony, Guienne, Anjou, and Maine, were delivered and lost by means of the said traitors.' This last circumstance especially irritated the nation; and to these causes of discontent were added the hardships caused by the statute of labourers and extortionate proceedings which vexed and irritated the commonalty. On the 17th of June, Cade and his followers were encamped at Blackheath. The king, who was with the parliament at Leicester, hastily collected his forces at London, and prepared to march upon the rebels. During this interval, Cade sent to the king the memorials which have been mentioned. Cade had been encamped about a week, when the king's forces marched to attack him; upon which he hastily retreated to Sevenoaks. The royalists, believing the rebels were in flight, detached a portion of their forces in pursuit; upon which Cade led his followers against this detachment, which was defeated, and Sir Humphry Stafford and his brother, who commanded it, were amongst the killed. Cade now resumed his encampment at Blackheath. The royalists were distrustful of their followers, and as a popular concession, the king's council committed to the Tower Lord Say and some others, who were disliked by the people on account of their connexion with the obnoxious ministry. The king's army then returned to London and dispersed. The archbishop of Canterbury and the duke of Buckingham were sent to negotiate with Cade, but he refused to lay down his arms until his demands were acceded to. On the 1st of July he marched from Blackheath for London. Some of the common council advised the admission of the rebels; and an alderman who opposed it was taken into custody. It was resolved that a neutral part should be taken, and the gates were opened to the insurgents. Cade rode through the streets, and struck the old London stone with his sword, exclaiming 'Now is Mortymer lord of this city.' He issued proclamations forbidding plunder, and each day withdrew his followers into the Borough to prevent disorder. On the 3rd of July, Cade sent for Lord Say, and had him arraigned at Guildhall. This nobleman claimed to be judged by his peers, on which he was taken by force to the Standard in Cheapside, and there beheaded. The sheriff of Kent, Lord Say's son-in-law, was also beheaded, on account of his alleged extortions. The mob soon began to exhibit the usual characteristics of an undisciplined multitude. On the third day of their being in possession of the city some houses were plundered: Cade himself plundered the house where he had dined. This conduct decided the citizens, who concerted measures with Lord Scales, the governor of the Tower, and it was determined to defend the bridge and prevent the entry of the rebels. The struggle lasted during the night, but the bridge was eventually taken by the royalists, and a short truce was agreed upon. In this interval the bishop of Winchester was sent by the archbishops of Canterbury and York, who were in the Tower, with a pardon under the great seal to all the rebels who were disposed to return to their homes. The offer was accepted by the mass of them, including Cade. Two days afterwards he again invited his followers to his standard, but they flocked around it in diminished numbers, and to attack the city was now hopeless. He therefore retired from Southwark to Rochester, where tumults and quarrels arose among the insurgents respecting the division of booty. On this Cade left them, and fled on horseback to Lewes, in Sussex. A reward of 1000 marks being set upon his head, he was taken by an esquire named Alexander Iden, and killed, after a desperate resistance, July 11. His head was placed on London bridge. The remainder of the rebels returned to their homes as quietly as possible. Some were taken and executed. (Sharon Turner's *History of England during the Middle Ages*, vol. iii. p. 181: Lingard's *History of England*, vol. v. p. 182.)

CADENCE, in music (*cadenza*, Ital., *cadence*, Fr., from *cado*, Lat., *to fall*), the close of a musical passage or phrase, or the resolution of a dissonant chord into a consonant one.

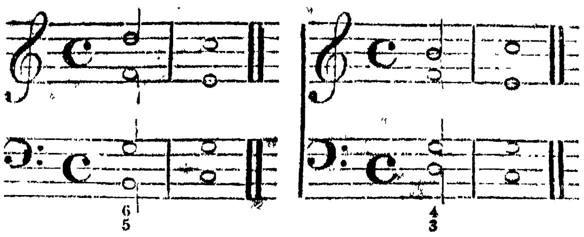
Cadences, which are in some degree analogous to punctuation in grammar, are resting places for the mind, serving to divide a composition into several parts, or to separate the different members of a musical sentence. They are either Perfect or Imperfect. The Perfect Cadence is composed of the chord of the Dominant, followed by that of the Tonic; likewise of the chord of the Dominant Seventh, succeeded by that of the Tonic.

Examples.

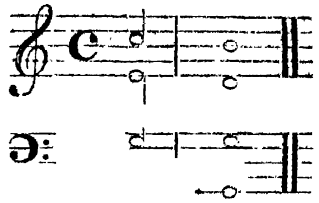


The first and second inversions of the Dominant Seventh, followed by the chord of the Tonic, also form Perfect Cadences, but are rarely used as final Cadences.

Examples.

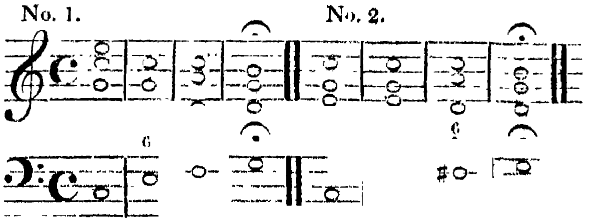


The Imperfect Cadence consists of the chord of the Tonic, followed by that of the Dominant, but is never met with as a final close, except in some very few old ecclesiastical compositions.



Albrechtsberger gives the subjoined formulæ of this Cadence.

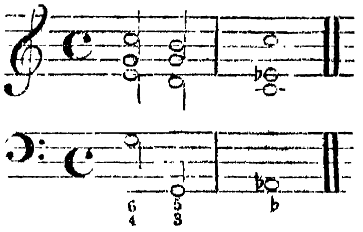
No. 1. No. 2.



But in No. 2, the introduction of the F sharp changes the key: G therefore is no longer the Dominant, but becomes the Tonic; consequently a composition thus ending terminates irregularly, and not with an Imperfect Cadence, if the accepted definition of the latter be correct.

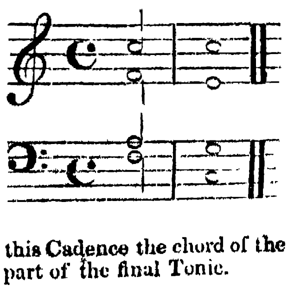
Besides the Perfect and Imperfect Cadences, many writers speak of the *Interrupted* or *Deceptive* Cadence. It is formed by a chord quite foreign to that which was expected, thus evading the close, and deceiving expectation.

Example.



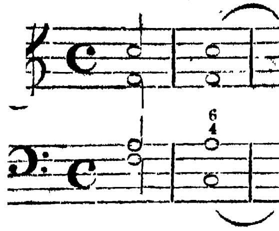
There is also another kind of Cadence, to which the name of *Plagal* is given; and this is sometimes classed as an Imperfect Cadence. It consists of the chord of the Subdominant, followed by that of the Tonic, and is occasionally used in church and other sacred music.

Example.



Sometimes in this Cadence the chord of the Subdominant is suspended on part of the final Tonic.

Example.



The term *Cadence* is also used to signify the addition made by the performer at the close of an air or concerto, and supposed to be an extemporaneous effusion, for the purpose of displaying such taste, skill, and power as the composition itself affords no means of exhibiting. The *Cadenza*, however, if introduced at all, should always be in good keeping with the air, &c., to which it is appended; it ought to preserve the same general character, and should invariably be brief, in the instance of vocal music especially. Formerly the *Cadenza* was, by Italian as well as English singers, considered indispensable, and many were the incongruous flights of ill-regulated fancy that audiences had to endure. The French never admitted it; the Italians have now wisely discarded it; the English alone retain what most sensible and reflecting people view as an absurdity, and what in a few years will, even in this country, be known only historically, for reason is beginning to have some sway over our performers: though they follow slowly in the march of intellect, they do not remain quite stationary, and already symptoms of an improved mode of thinking is manifest in some whose example will be influential.

The *Cadenza* is so called, says Rousseau, because introduced generally on the first note of the final Cadence.

CADER IDRIS is one of the highest mountains in North Wales. Though this name properly belongs to one peak, it has been extended to the whole western portion of the Berwyn mountains, which stretches from the peak to the sea-coast. This ridge begins near 52° 35′ N. lat., and 4° 5′ W. long., on the shores of Cardigan Bay, or rather in the bay itself; for the Sarn y Bwch, a ridge of huge stones which runs out into the bay and is bare at low water, may be considered as its commencement. The W. extremity of the Cader Idris mountains is about a mile N. of the small town of Towyn. Hence it proceeds with a gradual but almost constant ascent, first N. for about three miles, and then for about ten miles farther it runs E.N.E. till it joins the peak itself. Its breadth bears but a small proportion to its length; for a line passing across its base and intersecting its summits would scarcely be four and a half miles. In some parts it is a mere ridge, whose base hardly ever exceeds one mile in breadth. Its slopes are very steep and craggy on each side, more especially so on the S. slope: near Talyllyn lake the rocks rise nearly perpendicularly.

The peak, which stands at its E. extremity, rises to the elevation of 2914 feet above the sea, and in height is the third mountain of Wales. It consists of an immense rocky mass, of rather difficult ascent, on the summit of which is a small plain, with two rocky heads of equal height, one looking to the N and the other to the S. The view from its summit is very extensive: the mountain rises so far above all the hills which lie farther E., that the Wrekin in the plain of Shropshire is visible from it. Its sides, though mostly destitute of vegetation, present some variety, from having several small alpine lakes imbedded in the depressions of the rock. The rocks themselves are of primitive formation, consisting chiefly of different kinds of porphyry. (A. Aikin's *Journal of a Tour through North Wales*; and Davies's *Agricultural View*.)

CADI, or, according to the Persian pronunciation of the word, *Câzi*, sometimes written *Kazee* or *Kauzee*, is an Arabic word and the designation of an officer who was originally the supreme civil judge in all Mohammedan countries. In the Mohammedan states in India the câdi continues to be the chief judge; but in Turkey he is subject to the Mufti, and in Persia he stands under the Sheikh-ul Islâm or supreme judge (literally 'the elder or chief of the faith'), in all the principal cities where an officer of that rank resides, and the latter functionary has in general the further gratuitous aid of the council of Mullâs (Moollahs) or learned men. There is also in Persian courts of justice an officer, who has the title of Mufti, but without possessing the high authority of the office thus designated in Turkey: he must be a man of learning, whom the câdi consults for his advice upon subjects of intricacy, and who expounds and applies the law to cases, leaving the câdi to give it operation and effect. The total number of câdis in the Turkish empire at the time of Muradgea d'Ohsson was 465: their rank was proportionate to the importance of the towns in which they resided. The câdi of the Turkish capital had always been considered as the first of the Ulemâs, or Jurisconsults, of the empire: Murad I. (A.D. 1421—1451) conferred upon that officer the title of Câdi-askar, *i. e.* 'judge of the army.' His successor, Mohammed II., (1451—1481) appointed two functionaries of that rank at Constantinople; and Suleiman I. (1519—1566) made them both subordinate to the mufti or chancellor of the empire.

The law of all Mohammedan nations, which is administered by the câdis, is founded partly on the Koran, and partly on the Sunnah or tradition; but in Persia, since the establishment of the faith of the Shiites as the national religion of the country, jurists have rejected all traditions coming from the three first caliphs Abu Becr, Omar, and Osman, or from other persons who opposed the right of Ali to the succession of Mohammed.

It is insisted upon as one of the principal duties of a Mohammedan sovereign to appoint fit persons to the office of câdi. The prophet is recorded to have said, 'Whoever appoints a person to the discharge of any office, whilst there is another amongst his subjects more qualified for the same than the person so appointed, does surely commit an injury with respect to the rights of God, the prophet, and the Mussulmans.' The appointment must not be solicited or coveted; for the prophet has said, 'Whosoever seeks the appointment of câdi shall be left to himself; but to him who accepts it on compulsion, an angel shall descend and give directions.' A câdi, to make his appointment valid, must possess the qualifications of a witness, *i. e.* he must be free, sane, adult, a Mussulman, and unconvicted of slander. With reference to other qualifications required in a câdi, considerable diversity of opinion seems to exist among the different schools of Mohammedan jurists. According to the Hanefite school a câdi does not forfeit his office if, at the time of his appointment, he be a just man, and afterwards, by taking bribes, prove himself unjust; neither does that school consider the appointment of an ignorant man to the office of câdi as invalid, inasmuch as he may render to every subject his just rights by passing decrees according to the opinions of others. But the followers of Shâfeï maintain, that an unjust man is as incompetent to the office of câdi as to give evidence; and that the appointment of an ignorant man is not valid, because it supposes a capability of issuing decrees, and of deciding between right and wrong, which acts cannot be performed without knowledge. The câdi should administer justice in some public place: the Hanefites recommend the principal mosque of the town, because they consider the duty of the câdi to be of a pious nature, and because the prophet has said 'Mosques are intended for the praise of God and the passing of decrees;' but to this the Shâfeïtes object, as the place of worship would, in their opinion, be profaned by the approach of polytheists and other impure persons who attend the court of the judge. It is not lawful for a câdi to receive presents, except from near relations (within the degrees prohibited for intermarriage), or old and intimate friends; neither must he accept invitations to any feast or entertainment, unless it be a general one, and not given to him in particular. In his conduct to the parties in a suit the câdi should observe strict impartiality, behaving to both with an equal degree of attention; and likewise in his conduct towards witnesses in court he should be guided by the greatest caution, in order not to give the one a confidence above the other. He is moreover directed not to give judgment when he is hungry or thirsty, or at a time when his mind is not perfectly clear and unbiassed. A câdi is not permitted to appoint a deputy, unless by the authority of the imâm or spiritual superior; but the decrees of a deputy, whom he may have appointed without such authority, if passed in his presence or with his approbation, are valid, and if he appoint a deputy by authority of the imâm, he cannot afterward dismiss him, as the agent so appointed becomes the deputy of the sovereign himself. (The *Hedâya, or Guide; a Commentary on the Mussulman Laws*, translated by Charles Hamilton, vol. ii., p. 612, &c.; Malcolm's *History of Persia*, vol. ii., p. 445, 4to. edit.; Muradgea d'Ohsson, *Tableau de l'Empire Ottoman*, t. iv., p. 569-573, Harington, in the *Asiatic Researches*, vol. x., p. 475-51[illegible].)

CADIZ (called Cadix by the Spaniards), the principal commercial city of Spain, is situated on the S.W. coast of that kingdom, in the province of Andalusia, in 36° 31′ N. lat., and 6° 19′ W. long. The city, which is built on the extremity of a low narrow tongue of land, projecting about five miles N.N.W. from the island of Leon, is consequently surrounded on three sides by water. On the S.W. is the open sea, and on the N.E. is a deep bay formed by the peninsula and the mainland. The entrance to this bay lies between the city and the promontory of Rota, distant about five miles and a quarter N.W. by N. from Cadiz. The bay is of great extent, being nearly twelve leagues in circuit. It affords good anchorage; but the outer part is exposed to a heavy and dangerous sea during the prevalence of N.W. winds. The inner part is protected by an extensive mole, but the water is not sufficiently deep to allow ships of great burthen to approach nearer to the town than three-quarters of a mile, where there is from five to seven fathoms water. At the entrance of the bay N. of the peninsula are sunken rocks, called the Cochinos, the Puercas, and the Diamante; the first and second of these are about three-fifths of a mile, and the Diamante about a mile and a half from the city. Ships may pass in and out between the Puercas and Diamante, but only smaller vessels, piloted by persons well acquainted with the channel, can safely venture between the Cochinos and the Puercas. On the side of the bay opposite to Cadiz is the town of Santa Maria, which is the principal depôt of the wines of Xeres.

The city is defended by ramparts, regular bastions, and several outworks. It is inaccessible and almost unassailable towards the sea, the shore to the S.W. being very steep, while to the N. it is defended by sand-banks and the sunken rocks already mentioned. The bay is defended by the four forts of St. Sebastian, St Catherine, Louis, and Matagorda. The town has five gates, only one of which is on the land side. Between the ramparts and the sea, on the side towards the bay, are large and handsome promenades planted with trees.

The city is in form nearly a square, the sides of which are about one and a half English miles. The streets, which are well paved and lighted, and usually clean, are in some parts narrow, but not generally so; they are laid out with some regularity, and most of them cross each other at right angles. There are several squares, one of which, that of St. Antonio, is very handsome. The houses in the city are well built, in the style which was introduced by the Moors: they have two stories, with a square court in the centre surrounded by a double gallery. In hot weather an awning is spread over this court, and is sprinkled from time to time with water. The windows that open to the street have each a balcony, furnished with a *jalousie* blind to exclude the sun. The number of churches and convents is not so great in proportion to the population as is usual in the towns of Spain, but the proportion of hospitals and charitable institutions is greater. The town is badly supplied with water. That which is raised from wells is brackish and unwholesome. Rain-water is collected in cisterns; but the principal supply comes from the town of Santa Maria, between which place and Cadiz vessels are constantly passing with water. The tower or light house of St. Sebastian, which stands on the western side of the city towards the sea, is a very conspicuous object. The light is 172 feet from the ground, and in clear weather is visible to ships approaching from the Atlantic at the distance of six leagues.

The caraca or royal dockyard, has its entrance defended by the cross fire of the two forts Louis and Matagorda. It contains three great basins and twelve docks, or slips, for the construction of vessels of the largest size. At the time when Spain maintained a considerable navy, the dockyard was furnished with numerous workshops, and its magazines were filled with abundance of naval stores of all kinds. The manufacture of sail-cloth, and of ropes of all sizes up to the largest cables, was carried on in the premises; and upwards of 5000 men, shipwrights and others, were constantly employed throughout the year.

Cadiz was constituted a bishop's see in the reign of Alphonso the Wise, in the year 1264: the church of Santa Cruz was at that time erected into a cathedral. The bishop, whose diocese is of small extent and contains only twenty-eight parishes, is suffragan to the archbishop of Seville.

For a long time this city enjoyed a high degree of prosperity, arising from its trade with the Spanish American colonies. Previously to 1720, the monopoly of this trade was enjoyed by Seville, but in that year it was removed to Cadiz, which soon became one of the most opulent cities of Europe; foreigners of all nations had factories and commercial houses there, and the port seldom contained fewer than 500 or 600 vessels. In 1792 the imports from Spanish America were to the amount of 700,000,000 reals, or 7,295,833*l.*; in 1791, the amount of gold and silver, coined and uncoined, received from the same quarter exceeded 5,300,000*l.* This commercial activity was greatly checked by the war of 1793, and has since been wholly destroyed through the defection of the Spanish possessions in America. In the days of its prosperity, it is said that Cadiz hardly contained a person incapable of supporting himself, which state of things is so far altered, that a recent traveller informs us that 'scarce may one go forth into the streets by day or night without being pursued by crowds of beggars, and not unfrequently by women decently dressed, who still preserve a semblance of their former elegance, though begging their daily bread.'

The foreign trade of Cadiz is now in a state of great depression. That part of it which is carried on in Spanish vessels is confined almost entirely to the intercourse with Cuba, Puerto Rico, and the Philippine Islands. The limited trade between Cadiz and the former colonies of Spain on the continent of America, is now carried on in British and other foreign ships. The salt-fish imported from Newfoundland is conveyed in English vessels. Linens, silks, and woollen cloths, are imported from France, mostly in the ships of that country: staves are supplied by the United States of America, in vessels belonging to those states; and timber is imported from Russia and Sweden, in foreign bottoms.

The chief articles of export are wine, salt, fruit, oil, wool, and quicksilver, which are usually shipped in vessels bearing the flag of the country to which the shipments are made. The import and export *legal* trade of the port of Cadiz, during the three years 1833 to 1835, was carried on by the number of ships stated in the following table, in which are given the aggregate tonnage of the vessels, and the estimated aggregate value of their cargoes.

	Inwards Ships.	Tonnage.	Estimated value of carg
1833	291	35,052	£112,120
1834	314	37,506	162,364
1835	294	40,322	141,192
	Outwards.		
1833	294	35,588	£1,105,751
1834	302	35,880	1.118,182
1835	298	40,338	1,222,533

The great difference observable in the value of the inward and outward cargoes furnishes strong evidence of the fact which is otherwise sufficiently notorious, that the far greater part of the import trade of Spain is carried on through smugglers. It has long been the practice of the Spanish government to place restrictions upon foreign commerce. Many articles are wholly prohibited, and upon others so high a scale of duties is imposed, that the regular trade is altogether prevented by the lower rates at which contraband traders will introduce the goods and deliver them to the consumers. This state of things is greatly aggravated by the intricacy and vexatious nature of the custom-house regulations, and by the venality of the revenue officers, by means of which the illicit trade is favoured, while the legitimate trade is discouraged. The duty imposed upon many articles exceeds their original value; and as the smuggler is contented with an advance of from 20 to 25 per cent. in payment for his labour and risk, it is clear that little import trade will be left for the regular merchants. In addition to the government duties, there is a local tax imposed upon all imported goods, amounting to 10 per cent. upon the invoiced value, and from this tax the consumer is wholly relieved by the smuggler.

The prosecution of this contraband trade is greatly facilitated by the British settlement of Gibraltar, which is, in the fullest sense of the word, a free port. People of all nations, in amity with England, may come here for the purpose of trading, and may land, deposit, sell, and take away goods without any impediment whatever, except as regards wine and spirits, some regulations respecting those articles being considered necessary with reference to the health of the garrison. The only charge imposed by the British government is a slight port charge on the re-shipment of goods. With the exception of the small proportion required by the inhabitants, about 1600 in number, nearly the whole importations of Gibraltar find their way into Spain in defiance of, or in connivance with, the revenue officers of that kingdom. The total exports of British produce and manufactures shipped to Spain from the United Kingdom in 1834, amounted in value to 356,593*l.*, including cotton manufactures to the amount of 32,993*l.* In the same year the shipments to Gibraltar amounted in value to 460,719*l.*, of which 321,727*l.* consisted of cotton manufactures, the duties upon which at the custom-houses of Spain are exorbitantly high. This however forms but a small part of the contraband trade of that kingdom. In addition to the produce which finds its way directly from British colonies or through this country to Gibraltar, and which amounts to a considerable sum, the shipments from the United States, consisting of fish, maize, rice, salt provisions, flour, cotton, staves, tea, and tobacco, are estimated at three times the amount of the English trade. France sends to the same depôt every article of her manufacture in which she can undersell this country; and from the north of Europe are sent large quantities of salt-fish, stock-fish, provisions of all kinds, spirits, iron, steel, and spars.

In 1829 Cadiz was made a free port, at which goods might be landed and stored without payment of duties. The effect of this measure was, to render the city the grand focus of the contraband trade above described, and the privilege was withdrawn at the end of 1832.

The coasting trade carried on at Cadiz is of considerable amount; the vessels employed in it are from five to 60 tons burthen, and, including their repeated voyages, from 2000 to 3000 vessels annually enter the port. The goods thus brought to the town consist principally of provisions from the other maritime provinces, wine, brandy, grain, fruit, charcoal, and oil: the return cargoes are chiefly of colonial produce, silk, linen, and woollen goods.

The manufactures carried on in the city consist of soap, glass-ware, course woollen cloths, cotton and silk fabrics, the materials for which are spun by the hand, and hats: there are likewise some sugar refineries and tanneries. The *Society of Friends of the Country* has recently introduced the cultivation of the cochineal plant and the production of the cochineal insect. Both thrive well, and through the exertions of the society this branch of industry has been adopted to some extent in the neighbouring district.

Cadiz was founded by the Phœnicians many centuries before the Christian æra, but there is no historical evidence as to the time of the settlement. Its Phœnician name was Gadir or Gadeira, which was changed into Gades by the Romans, under whom it became a municipium, called Augusta Urbs, Julia Gaditana. The city stood at the west end of the small island, which was then separated from the mainland by a channel about 600 feet wide; at this part was the Temple of Hercules. The earthquake which nearly demolished Lisbon in 1755 caused the sea to rise and overflow the country about Cadiz to a great extent, on which occasion the ruins of several antient buildings were brought up by the shock, and left behind on the receding of the water. Under the Romans Gades was one of the richest provincial towns in the empire, and a place of great trade.

The city was carried by assault and pillaged and burnt in 1596 by an English expedition under Lord Effingham, who obtained an immense booty on that occasion. It was again attacked in 1702, but not with equal success, by an expedition under the duke of Ormond and Sir George Rooke in conjunction with the Dutch. At the breaking out of the resistance offered by the Spanish nation to the usurpation of Joseph Bonaparte in 1808, the harbour of Cadiz contained a large naval force under the national flag, and a French fleet consisting of five line of battle ships and a frigate. The Marquis de Solano, governor of Cadiz, a man in the interest of France, was on that occasion seized and killed by the inhabitants, who gained possession of their own ships, and proceeded to attack from the batteries those of France, which being prevented from attempting an escape by the English fleet under Lord Collingwood, were forced to surrender to the patriots.

The first assembling of the national cortes when convoked by the central junta in 1810 took place in Cadiz, which in the same year was invested by the French forces under Marshal Victor. The siege proceeded but slowly, and in fact was little more than a blockade, against which the garrison, being open to receive provisions and reinforcements by sea, were enabled to hold out, until on the 12th of August, 1812, the siege was raised, in consequence of the successive advantages gained by the English troops under Lord Wellington.

The king, Ferdinand VII., who, during the progress of the war from 1808, had been detained a prisoner in France, returned to his kingdom at the general peace in 1814, and immediately abrogated the constitution of 1812 decreed by the cortes, and declared that body dissolved. The dissatisfaction that was thus occasioned was rendered apparent from time to time by the breaking out of conspiracies, one of which, in 1820, was so far successful, that the constitution of 1812 was again proclaimed, and the king was made to swear to support it. The jealousy with which these movements were viewed by the French government gave occasion to the assembling on the frontier of a large French army, to which the name of 'cordon sanitaire' was applied, under the absurd pretence of preserving France from the visit of a malignant fever then prevalent in Spain. Having reason to mistrust the sincerity of the king, the cortes, who had been assembled at Seville, obliged him, in June, 1823, to proceed to Cadiz, upon which the French troops advanced and invested that city. The Duke d'Angoulême arrived on the 10th of August at Port St. Mary, and placed himself at the head of 30,000 men. On the last day of that month he succeeded in gaining possession of the Trocadero, a position which commands all the approaches to the city, and opened a communication with Ferdinand, who, on the 1st October, proceeded to the head-quarters of the French, whence he issued an order for the delivering up of the city to the besiegers, who accordingly took possession on the second day after. The French troops retained possession until the summer of 1828. (Strabo, iii. p. 168, &c., Casaub.; Plin., *Nat. Hist.* iv. 22, &c.; Laborde's *View of Spain; *Malham's *Naval Gazetteer;* Townsend's *Travels in Spain*, &c.)

CA'DMIUM, a peculiar metal discovered in 1818: it was found in some ores of zinc, and especially in the Silesian. On account of the effect which was produced by the action of sulphuretted hydrogen upon some preparations of zinc, the presence of arsenic was suspected, but the appearance was found to be owing to this new metal. The first notice of its existence was by Hermann, but Stromeyer more particularly examined and detailed its properties, and gave it the name of *cadmium*, from *cadmia fossilis*, a name by which the common ore of zinc was formerly known.

In order to separate cadmium from the mineral containing it, it is to be dissolved in sulphuric acid, and the solution, which should have excess of acid, is to be diluted with water, and to have a current of sulphuretted hydrogen gas passed into it, until a yellow precipitate ceases to be formed. This precipitate is sulphuret of cadmium, which is to be dissolved in concentrated muriatic acid, and the excess of acid being expelled by evaporation, the residual salt is to be dissolved in water, and precipitated by carbonate of ammonia, an excess of which dissolves any oxide of zinc or copper that may have been thrown down by the sulphuretted hydrogen with the sulphuret of cadmium. The carbonate of cadmium thus obtained is to be heated to redness, then mixed with lamp-black, and heated to dull redness in a glass or porcelain retort: it is thus reduced, and the metal distilled. The impure Silesian oxide of zinc is stated to contain from 1¼ to 11 per cent. of this new metal.

Cadmium has the colour of tin, is brilliant, and susceptible of a fine polish. Its fracture is fibrous, and it crystallizes readily in regular octahedrons; while solidifying, its surface is covered with arborations like fern leaves. It is soft, easily bent, filed, and cut: it stains substances upon which it is rubbed, like lead. When bent it gives a peculiar crackling noise, like tin. It is very ductile, easily drawn into wire and beaten into thin leaves. Its specific gravity after fusion is 8·604, but when beaten 8·694. Cadmium melts below a red heat; and at a temperature a little above that of boiling mercury, it boils and distils in drops. The vapour of cadmium has no particular odour. Like tin it is slowly acted upon by the air, but is eventually tarnished by it.

Oxygen and Cadmium readily unite to form one oxide. It may be procured either by burning the metal, or decomposing a solution of the metal with an alkali, and washing and calcining the precipitate. The colour of oxide of cadmium depends upon its state of aggregation: it is either deep reddish yellow, bright brown, deep brown, or even black. It is neither fusible nor volatile, even at a very high temperature. Oxide of cadmium is insoluble in water, but is precipitated in the state of hydrate by solution of potash; this hydrate is white, insoluble in the fixed alkalis, but soluble in ammonia. Carbonate of ammonia, however, does not dissolve it, and this difference between it and oxide of zinc serves as a process for separating them. Oxide of cadmium is composed of—

1 Equivalent of oxygen = 8
1 „ „ cadmium = 56

Equivalent of oxide 64

No compound of azote or hydrogen and cadmium is known.

Chlorine and Cadmium combine to form only one chloride: this compound may be obtained by dissolving either the metal or its oxide in muriatic acid. The solution, by spontaneous evaporation, is gradually converted into a mass of short satiny crystals, composed of—

1 Equivalent of chlorine = 36
1 „ „ cadmium = 56
2 „ „ water = 18

100

These crystals are readily soluble in water, and effloresce in warm dry air. The effloresced salt fuses below a red heat, and on cooling it assumes the appearance of a transparent lamellated crystalline mass, which has a faint, pearly, metallic lustre. By exposure to the air it acquires water, and falls to powder.

No compound of carbon and cadmium is known.

Sulphur and Cadmium unite to form only one sulphuret, which consists of—

1 Equivalent of sulphur = 16
1 „ „ cadmium = 56

Equivalent of sulphuret 72

This metal does not readily unite with sulphur when they are heated together. The compound is more easily formed when the oxide is heated with it, but the best method is to precipitate a salt of cadmium with sulphuretted hydrogen. This sulphuret has a yellow colour, inclining to orange. It was this colour which first led to the suspicion that zinc contained arsenic. When heated to redness it becomes brown, and afterwards carmine red, but on cooling it resumes its original colour. It is not decomposed at a high temperature; but a strong white heat melts, and causes it to crystallize on cooling in transparent plates of a fine yellow colour. Concentrated muriatic acid decomposes it with the evolution of sulphuretted hydrogen, and without any deposit of sulphur. Nitric acid converts it into sulphate of cadmium.

Phosphorus and Cadmium combine readily; the resulting phosphuret is grey, has a weak metallic lustre, is brittle, and but slightly fusible. When heated in open vessels it burns with a very bright phosphoric flame, and is converted into phosphate of cadmium. It dissolves in muriatic acid with the evolution of phosphuretted hydrogen gas.

Iodine and Cadmium may be made to combine by treating the metal with iodine, either in the moist or dry way. Iodide of cadmium forms large hexagonal tubular crystals, which are colourless and transparent, have a shining pearly lustre, and do not alter by exposure to the air. This salt is readily soluble both in water, and in alcohol. The crystals fuse readily, losing their water of crystallisation, and again crystallizing. At a higher temperature this salt is decomposed, iodine vapourizing, and metallic cadmium being left. It is composed of—

1 Equivalent of iodine = 126
1 „ „ cadmium = 56

Equivalent = 182

Fluorine and Cadmium form a fluoride which is but little soluble in water, but more so when acid is in excess. On evaporating the solution an irregular crust is deposited, which adheres to the vessel. It is composed of—

1 Equivalent of fluorine = 18
1 „ „ cadmium = 56

Equivalent = 74

The various acids combine with oxide of cadmium to form salts, the general properties of which are, that a considerable number of them are soluble in water, and the solutions are in general nearly or quite colourless: the insoluble salts are also commonly devoid of colour. The soluble salts are decomposed by ammonia and the fixed alkalis, they throwing down white hydrate of cadmium, which an excess of ammonia redissolves. The alkaline carbonates precipitate white carbonate of cadmium; sulphuretted hydrogen occasions a yellow deposit; ferrocyanide of potassium a white one, and infusion of galls produces no effect. A plate of zinc throws down metallic cadmium.

Nitrate of Cadmium crystallizes in radiating needles, which attract moisture from the air, and are very soluble in water. This salt consists of—

1 Equivalent of nitric acid = 54
1 „ „ oxide of cadmium = 64
4 „ „ water = 36

Equivalent = 154

Carbonate of Cadmium is readily obtained by adding a solution of carbonate of soda to one of nitrate of cadmium. It is a white insipid powder which is insoluble in water. When heated it is decomposed, owing to the expulsion of the carbonic acid. It is constituted of—

1 Equivalent of carbonic acid = 22
1 „ „ oxide of cadmium = 64

Equivalent = 86

Sulphate of Cadmium crystallises in large transparent prisms, much resembling sulphate of zinc in appearance. This salt readily dissolves in water. It effloresces when exposed to the air, and at a low heat loses its water of crystallization without fusing. The dry salt is not easily decomposed, a low red heat not being sufficient to expel the sulphuric acid; but at a higher temperature it loses part of its sulphuric acid, and becomes a subsulphate. Its constituents are—

1 Equivalent of sulphuric acid = 40
1 „ „ oxide of cadmium = 64
4 „ „ water = 36

Equivalent = 140

Acetate of Cadmium crystallises in fine needles, which are readily soluble in water, and do not alter in the air; they are composed of—

1 Equivalent of acetic acid = 51
1 „ „ oxide of cadmium = 64
2 „ „ water = 18

Equivalent = 133

These are the most important crystallizable salts of cadmium; with phosphoric, boracic, oxalic, arsenic, tartaric, and citric acids, oxide of cadmium forms salts which are nearly or quite insoluble in water.

Alloys of Cadmium.—Several metals readily combine with cadmium, and form with it brittle alloys, and when they are strongly heated the cadmium is volatilized.

Copper and Cadmium form a yellowish white brittle alloy, and a small quantity of cadmium is sufficient to produce this effect; 100 parts of copper retain 82·2 of cadmium when exposed to a red heat, but when the alloy is heated to the fusing point of copper the cadmium is volatilized entirely.

Platina and Cadmium yield an alloy which is of a silver white colour, brittle, and not readily fusible; 100 parts of platina retain 117·3 of cadmium at a red heat.

Mercury and Cadmium readily unite, and form a fine argentine amalgam, which crystallizes in octahedrons. The crystals fall to the bottom of the mercury, and are consequently of greater specific gravity. The saturated amalgam is composed of 78·26 of mercury, and 21·74 of cadmium.

Cadmium not having been long discovered, no very great use has been made of it. If larger quantities of it should be obtained, its malleability may render it useful for several purposes. The sulphuret would probably be employed as a pigment, and sulphate of cadmium has been used in medicine as a substitute for that of zinc in collyria, but whether with any advantage over it has not been determined.

CADMIUM, ORES OF. Properly speaking, no ore of this metal has yet been discovered, for it occurs in such small quantities in the minerals in which [illegible] been detected, that it may rather be considered as an accidental impurity than an essential constituent part. It is thus usually found associated with the ores of zinc, the greatest proportion being found by Stromeyer to be about 5 per cent. in the radiated zinc-blendes of Bohemia. It has also been found by Dr. Clark in the oxides of zinc both of Freiberg and Derbyshire; and its presence may also be generally detected in the common zinc of commerce, and may usually be obtained in considerable quantity mixed with the soot from the crucibles in which the oxides of zinc are reduced by being heated with coal, portions of this substance from the zinc works of Bristol being found to contain from 12 to 20 per cent. of cadmium.

CADMUS, the name of several persons in Greek history. The most famous was the legendary founder of Thebes, who was the son of Agenor, king of the Phœnicians, and was sent in search of his sister Europa, who had been carried off, according to the old fable, by Jupiter under the form of a bull. Cadmus touched at Thera, where he left Membliarus and some of his followers (Herod., iv. 147), and thence proceeded to Bœotia, where, in obedience to the oracle, he formed a settlement on a spot pointed out by a heifer which he had followed, and which lay down by the streams of Dirce. He had, however, in the first place, to kill a fierce dragon who guarded the place, and on sowing the monster's teeth, as he was directed to do, a host of armed men sprung from the ground, and fought with one another till all but seven were slain. These seven joined Cadmus in founding Cadmeia, subsequently the citadel of Thebes: hence the Thebans were called Sparti (sown men). All these legends are given successively in a chorus of Euripides (*Phœniss.* 641—680, and Scholiast.), and various attempts have been made to explain them. Some contend with Herodotus for the Phœnician origin of the traditions, others refer them to Egypt, and one modern scholar has endeavoured to prove that Cadmus was the leader of a Cretan colony. We have given in a former article [BŒOTIA] some reasons for believing with Müller that Cadmus was an old Pelasgian god. Indeed, positive evidence has been given that he was identical with Cadmilus, the father of the Cabiri, and that his wife Harmonia was also connected with the Samothracian rites. (Müller's *Orchomenos*, p. 461.) The legend goes on to relate that he and his wife were changed into serpents, and that he retired to Illyria (Pausan. ix. 583), from whence he led a host of barbarians into Greece and sacked Delphi (Herod. v. 61, ix. 43; Eurip. *Bacchæ*, 1333; Niebuhr, *Hist. Rom.*, i. p. 50). To Cadmus is attributed the invention of 17 letters of the Greek alphabet, the remaining 8 having been added by Palamedes and Simonides. (Plin., *Hist. Nat.*, t. vii. c. 56.)

CADMUS, of Miletus, was the first Greek prose writer. He lived towards the end of the seventh or the beginning of the sixth century B.C., and wrote a history, in four books, of the foundation of his native city and the colonization of Ionia, which was epitomized by Bion of Proconnesus. (Clem. Al. Strom., vi. p. 629; Plin., *Hist. Nat.*, vii. 56, v. 29; Isocrates, περὶ Ἀντιδόσεως.)

CADSAND, or KADZAND. [ZEELAND.]

CADUCEUS, a staff of laurel or olive, with a representation of two snakes twisted about it. The caduceus was the symbol of Mercury, to whom, according to the fable, it was given by Apollo, in return for the lyre which Mercury had presented to him. It was also the badge of the heralds of antient Greece; and the name, which is also written Caduceum, is apparently only a corruption of the Greek κηρύκειον (kerukeion), herald's staff. In its oldest form it was merely a bough, like the Greek ἱκετήριον (hiketérion), and the Roman *supplicia*, twined about with white wool. Afterwards a white or gilded staff, with imitations of foliage and ribands, was substituted for the old rude symbol. These were probably not turned into snakes till a much later age, when that reptile had acquired a mystic character. Many explanations of the caduceus have been attempted by modern scholars; the most plausible is that of Böttiger, who supposes that it was a representation of a peculiar knot (the *nodus Herculis*, Macrob. I., Saturn., c. 19) used by the Phœnicians in cording up their packages, and thence adopted by them as a means of signifying to the inhabitants of the countries on which they landed their wish to be upon a friendly footing with them; and as the Phœnicians were, generally speaking, the first strangers with whom ar
of Greece had intercourse, their symbol of amit
bably be used for the same purpose whenever an occasion offered. (Böttiger, *Vasengemälde*, part ii., p. 97, *Amalthea*, vol. i., p. 104—116.)

CÆCILIUS STATIUS, a Gaul, originally a slave. He received the name *Cæcilius* when he became free. He died about one year after his friend Ennius, that is, B.C. 168. Cæcilius wrote thirty comedies in the Latin language, of which only fragments remain in the writings of Cicero, Aulus Gellius, and the grammarians. His merit has been variously estimated by the antients: Cicero (*ad Attic.*, vii. 3) condemns his style as bad, and Quintilian (x. i.) does not assent to the praises which had been bestowed on him by others. Horace (*Epist.* ii. i. 59, *de Art. Poet.* 54), on the contrary, praises him as in some points superior to Plautus and Terence; and Vulgatius Sedigitus (in Aul. Gell. xv. 24) gives him the highest rank in comedy. Many of his plays were imitations of Menander; and Aulus Gellius (ii. 23) says that when he read them separately they appeared rather pleasing and lively, but that when compared with the Greek originals they were perfectly disgusting. In the same very valuable chapter Aulus Gellius gives a scene from the Plocium (πλόκιον, *necklace*) of Cæcilius with the scene of Menander from which it is copied. They differ as much in brightness, he says, as the arms of Diomed and Glaucus. (See Terence, *Hec. Prol.* 5.)

CAEDMON, the father of English song, or the first person of whom we possess any metrical composition in our vernacular language. This composition is a kind of ode consisting of no more than eighteen lines, celebrating the praises of the Creator. It is preserved in Alfred's translation of Bede. Bede gives the following account of the production of it, and of the author. Caedmon was in some kind of connexion with the monks of Whitby: he seems to have had the care of their cattle. So far from having the gift of song, when he was present at any convivial meeting, and the harp passed round among the guests (it appearing to have been the custom of our Saxon forefathers to amuse themselves with improvisatore descants accompanied by this instrument, as is still practised at meetings of the Welsh bards), when it was approaching him he shrunk away, and would leave the assembly and retire to his own house. One day he had thus departed from a house of mirth, and at night he laid himself down and slept. In his sleep some one seemed to say to him, 'Caedmon, sing me something;' he replied, 'I cannot sing;' 'Yet thou must sing to me,' said the voice: 'What shall I sing?' said he; 'Sing me the origin of things.' The subject thus given him, he composed the short ode in question. When he awoke, the words were fast in his mind.

This need not be set down at once as a legendary tale, there being nothing of extreme improbability in it. The effect was that Caedmon became admitted by the Abbess Hilda into the company of the holy men whom she had collected round her in her monastery at Whitby. He continued to receive poetic inspiration, and he composed numerous poems on sacred subjects, which were sung in the abbey for the edification of its inhabitants. Sacred subjects were his delight, and to them he confined himself. He continued in the monastery for the remainder of his life, and there he died, as is conjectured, in the year A.D. 680.

The authenticity of the little poem above mentioned is perhaps unquestionable. But besides this, a very long Saxon poem, which is a metrical paraphrase on parts of the Scriptures, is attributed to Caedmon. An edition of it was printed at Amsterdam in 1655, under the care of Junius. Hickes expresses doubts whether this poem can be attributed to so early a period as the time of Caedmon. He thinks he perceives certain Dano-Saxonisms in it which would lead him to refer it to a much later period. It has been again printed by Mr. Thorpe as a publication by the Society of Antiquaries, London, 8vo. 1832. Mr. Thorpe is of opinion that it is substantially the work of Caedmon, but with some sophistications of a later period. At all events the poem seems to have been popular, and to have been much used in later times by the makers of the mysteries which furnished so much of the amusement of our ancestors. An attempt has been made to show that the parts respecting the creation and our first parents had been studied by Milton.

The works to which those persons will have recourse who desire to enter at large into this subject, are the two editions
by Junius and Thorpe; Warton's 'History of
try;' Conybeare's 'Illustrations of Anglo-Saxon

Poetry, and the [illegible] ume of the Archæologia, where engravings are giv[illegible] e very curious illustrations of this poem in the manu[illegible] of it, the [illegible] e that is known, in the Bodleian library at Ox[illegible] manuscript, it is believed cannot be later than [illegible] century.

CÆLIUS AURELIA'NUS, [illegible] only remaining writer of the sect of the Methodists [illegible] e, was born at Sicca in Africa. The time when he lived is uncertain; as neither he nor Galen [illegible] on each other, it has been supposed that they were con[illegible]; while others have thought, from the barbarousness of his style, that he must have lived as late as the fifth century. But his African origin as well as the imperfect education which, in common with the majority of the Methodists, he probably received, will account for [illegible] barous Latinity, as well as his blunders in Greek. Thus he translates ὀρθόπνοια by *spirandi correctio*, σχάσαι φλέβα by *venam laxare*, instead of *venum secare*, and derives μανία from μονοῦσθαι, because the melancholy love solitude. His work, which consists of eight books, three on acute and five on chronic diseases, is a translation into Latin of the writings of Soranus, a Greek physician, of the time of Hadrian, with additions from his own practice and from other authors.

Cælius Aurelianus appears to have been an observant practitioner, and gives several original cases in medicine as well as surgery. He had seen an instance of *idiopathic* hydrophobia, *i. e.* where the disease did not proceed from the bite of a rabid animal, but arose spontaneously; and mentions the occurrence of hydatids in some kinds of dropsy. He had seen a fit of the gout terminate in apoplexy from the too liberal use of bitter and acrid substances; and among his practical precepts we may cite the recommendation of oil as an injection for the cure of ascarides (thread worms). The medical sect of Methodists held a middle place between the dogmatists and the empirics. The dogmatists maintained that the practice of physic must depend upon the theory, and that he who is ignorant of the origin of diseases cannot treat them with advantage. The empirics, on the other hand, alleged that medicine depends on experience alone, and that the physician, like the husbandman or the steersman, is formed by practice, not by discussion. The former sect studied anatomy, the latter neglected it. (Celsus, *de Med.* lib. 1.) The Methodists combined something of the theoretical turn of the dogmatics with the practical simplicity of the empirics, but it must be owned that they carried this simplicity too far. Thus Themison, their founder, 'reduced all diseases to three kinds only, the *strictum*, the *laxum*, and the *mixtum*; the last consisting of the strictum in one part of the body, and of the laxum in another. He maintained that it was enough to refer any particular disease to one or other of these three heads, in order to form the proper indications of cure. This easy plan was, by way of eminence, called the Method, and the persons who followed it the Methodics.' (Cullen, *Introductory Lectures,—History of Medicine.*)

With them, as with others, theory sometimes succeeded in stifling the best-established practice. Thus the Methodists, not satisfied with banishing specifics from the practice of physic, declared war even against purgatives, which are of more general utility. These remedies had been denounced by Chrysippus, Erasistratus, Asclepiades, and Thessalus. Cælius agrees with them, and after having blamed Her[illegible] the empiric, who purged phrenitic patients with [illegible], he asks him, 'Where do you think the crudity [illegible] which you imagine you expel by your purgatives? If you say it is in the intestines, a clyster will suffi[illegible] it. Is it in the head, or in the whole body? You [illegible] swer, and leave it uncertain. This is a proof that you trust to the good conduct of your medicine, and believe that it acts like an intelligent animal, discerning what is corrupt f[illegible]m what is not, and expelling the former, but not the [illegible] As the philosopher of old who denied motion was answered by one who walked across the room, so these ingenious speculations are to be refuted by the multitude of cures effected by remedies which are theoretically [illegible] injurious. On the whole, however, Cælius Aurelianus [illegible] his [illegible] ng the second class of medical writers, [illegible] those who, though not great discoverers, yet hand down to posterity, with useful additions, the rich inheritance of [illegible] which [illegible] y have received.

The first editions of Cælius A[illegible] lianus are that of Paris, 1529, folio, containing [illegible] books on [illegible] diseases, and that of [illegible] of the same year and size, containing only the five books on chronic diseases. It is curious [illegible] same century [illegible] John [illegible] who edited the latter edition, thought that the [illegible] acute diseases had been lost with the other [illegible] ks of Cælius Aurelianus. The third edition was printed [illegible] Aldus, 15[illegible] folio. This edition (in which Cælius Aurelianus is joined with other writers) contains only the five books on chronic diseases. There is a complete edition by Dalechamp with marginal notes, Lyons, 1567, 8vo. The best edition is that of Almeloveen, Amsterdam, 1722 and 1755. (*Essai d'une Histoire pragmatique de Médecine par* Kurt Sprengel, *traduit par Geiger*, tom. ii. p. 42, et seq.; Le Clerc, *Histoire de la Médecine*, Amsterdam, 1702, *Seconde Partie*, p. [illegible]8, et seq.)

CÆLUM SCALPTO'RIS, the sculptor's tool, a constellation of Lacaille. It is situated below Columba Noachi and Canis Major, low enough not to rise in this country.

Character.	No. in Catalogue of		Magnitude.
	Piazzi.	Astron. Society.	
δ	(129)	525	5
α	(175)	548	4½
β	(181)	549	5
γ	(308)	598	5

CAEN, a city in the north of France, in the department of Calvados, on the banks of the river Orne, at the confluence of the Odon with that river: 121 miles in a direct line W. by N. of Paris, or 134 miles by the road through Mantes, Evreux, and Lisieux; in 49° 11′ N. lat., and 0° 23′ W. long.

Caen does not appear to have existed in the time of the Romans, at least it is not mentioned by any of the Latin writers; but conjecture, in the absence of testimony, has ascribed its foundation to Phœnicians, Romans, Gauls, Saxons, and Normans. William de Talleur of Rouen, the author of an old Norman chronicle written in the fifteenth century, makes it one of the good towns of Normandie in the middle of the tenth century. Early in the eleventh century it is described in a charter of Richard Duke of Normandie as possessing churches, a market, a custom-house and a quay. In this charter the town is called Cathim; from Cathim was derived Cahem, and from this again Caen. In the Latin of the monkish historians the name is Cadomus or Cadomum.

Just before the conquest of England by the Normans Caen appears to have been an open town. Huet, bishop of Avranches, considers that the first fortress was built here by William the Conqueror, who frequently made this place his residence. Here that prince and his queen Matilda built respectively the abbeys of St. Etienne (St. Stephen), and the Holy Trinity. In the church of the abbey of St. Etienne the body of William was interred.

In the transactions of the duchy of Normandie Caen took little share, but it appears as a place of importance in the wars of the English in France, under Edward III. and the princes of the house of Lancaster. In 1346, just after it had been walled in, it was besieged by Edward III., who had landed at La Hogue with his son the Black Prince. The town was, as Froissart tells us, 'large, strong, and full of drapery and all other sorts of merchandise, rich citizens, noble dames and damsels, and fine churches.' The constable of France and several other nobles commanded the garrison; but their efforts were rendered unavailing by the rashness of the citizens, who, confiding in their numbers, demanded to be led out against the enemy. They were defeated; the conquerors entered the town pell-mell with the vanquished; the place was plundered; and the English fleet returned home loaded wi[illegible] rich merchandise and several prisoners. In 1417 C[illegible] was again taken by assault by the English, and was given up to indiscriminate plunder, not even the churches escaping the ravages of war. The town remained in the possession of the conquerors till 1450, when it was reannexed to the crown of France by the Count of Dunois, to whom it capitulated after a gallant resistance; and since that time it has never been in foreign hands.

In 1512 a dreadful affray took place in Caen, occasioned by the disorderly conduct of some German lansquenets, whom, to the number of 6000, Louis XII. had placed here in garrison: 300 of the Germans fell in the tumult; the [illegible] men is unknown. In the course of the [illegible] town suffered from the religious wars which arose in France: it was [illegible]red by the Calvinists, into whose hands it fell; and much of what was saved from their violence was taken by the Catholics, under the pretext of putting it in a place of security.

Caen is situated in a level tract, almost wholly consisting of unenclosed fields of buck-wheat and other corn, extending with monotonous continuity as far as the eye can reach. The appearance of the town from a distance is grand, both from its extent and the number of towers and spires that rise from it. The streets are wide and the houses are built of stone. It is intersected in various directions by the branches, natural and artificial, of the Odon, the banks of which are in many places formed into walks, and adorned by avenues of noble trees. The *grand cours* is almost as fine a promenade as the *grand cours* of Rouen. There are some antient houses with the gable to the street, and presenting on the front elaborate carvings of wood. They resemble in their general character the older houses in the city of Chester and elsewhere. The town has few fountains, the want of which is supplied by wells. The *Place Royale* is a large and regular square, and the public edifices are numerous and striking. There have been considerable improvements of late years in the outskirts of the town, which are facilitated by the circumstance of stone being quarried in the immediate neighbourhood. There are but slight remains of the antient walls and towers by which the town was defended.

The public buildings of Caen are interesting as the relics of former ages. The castle, said to have been built by William the Conqueror, enlarged by Henry I. of England, and much altered at a subsequent date by the French kings, still claims to be ranked as a place of defence, though it retains few of its original features. The towers which flanked the ramparts have been brought down to the level of the platform, and the donjon tower has been destroyed; but though the castle has suffered these mutilations, the extent of its site, the thickness of its walls, and the width of its ditches, testify its original importance. Another castellated building called the Château de Calix, at the extremity of the suburb of Calix, is adorned with several medallion-busts in low relief carved in stone on the walls: there are also on the battlements two stone figures of such doubtful character, that while Mr. Dawson Turner supposes them to be Neptune or some other sea-god and Hercules, the common people regard them as *gens d'armes* mounting guard on the castle, which is often called from them the *Château de Gendarmerie.* This building is probably not older than the beginning of the 16th century.

Among the chief ornaments of the town are the two royal abbeys. The monastic buildings of the abbey of St. Etienne are now appropriated to the use of the *collège* or high school. The church is magnificent: the eastern end, with its wide semicircular sweep and slender turrets, approaches to the character of an oriental mosque; the western front is divided by buttresses into three parts, the outer two of which rise into towers, and are surmounted with lofty octagon spires. The central tower of this church was undermined and much injured by the Huguenots: it is surmounted by a short conical spire or roof. The tomb and coffin of William the Conqueror were broken open by the Huguenots in 1562, and the bones dispersed and lost except one, which also was afterwards removed. An antient building, now in ruins, in the precincts of the abbey, is called the palace of William the Conqueror, though of a later date than his time; and it may be questioned if it was ever a royal palace at all. The monastic buildings of the abbey of the Holy Trinity (for nuns) are modern: the church, now used as an hospital or workhouse for the department of Calvados*, is one of the noblest specimens extant of the solid grandeur of Norman architecture: the west front, though deprived of the lofty spires with which its towers were surmounted, far exceeds that of the rival abbey of St. Etienne. This abbey in the middle ages united the seemingly incongruous characters of a nunnery and a fortress. Of the parish churches, that of *St. Etienne le Vieil* has on the wall of its choir an equestrian figure of very disputable date, supposed to be part of a groupe representing the entry of William the Conqueror into Caen: the church of St. Pierre is remarkable for a light, elegant, and symmetrical tower and spire erected in 1308, and hardly inferior in elevation to those of Salisbury cathedral. The church of St. Nicholas, built by William the Conqueror, about A.D. 1060, is now used as a stable.

The population of Caen by the census of 1832 was 37,019 [illegible] the town or 39,140 for the whole commune. The town [illegible] the centre of a rich agriculture and a considerable inland trade: it is a manufacturing town and a port. The union of the Odon with the Orne forms a stream capable of bearing at high tides vessels of 200 tons, but ordinarily it admits only much smaller ones. Many plans have been suggested for the improvement of the port; and Napoleon, following a suggestion made long since by Vauban, desired to make it a naval station. The ramifications of the Odon offer great advantages for mills and manufactories. Hosiery, cotton yarn, calicoes and other woven goods are manufactured here; there is a considerable sugar-refining house, and many oil-mills; and paper-hangings are made. But the chief article of manufacture is [illegible]e; the streets are lined almost uninterruptedly with [illegible] ndboys engaged [illegible] this branch of industry, and it is calculated that 20,000 persons in and about Caen are engaged in the production of this article, which is in high estimation for its beauty and quality, and is exported in considerable quantity.

Caen has an *Académie* or University, the first establishment of which is due to the English. Henry VI. of England, or rather John Duke of Bedford (then regent of Normandie) in his name, founded a college in 1431, which was subsequently enlarged in its plan and sanctioned by the bulls of Pope Eugenius IV. Upon the conquest of the province by the French this university was dissolved (A.D. 1450) with a view to the founding of a new one by the French king; but the old one was re-established and replaced on its original footing in 1452. In the estimation of the inhabitants the university of Caen now holds the third place in France, those of Paris and Strasburg being the only ones allowed to surpass it. There are a *collège* or high school, a school of medicine, one of drawing and architecture, and one of navigation, geometry, and mechanics applied to the arts. The Academy of Arts, Sciences, and Belles Lettres, the Society of the Antiquaries of Normandie, the Linnean Society, and the Central Society of Agriculture, present the elements of a Provincial Institute, the formation of which is suggested by M. Dupin. There are a good public library of 40,000 volumes, a museum of natural history, a botanic garden, a collection of paintings. The town has produced several men of literary eminence; among them are Malherbe, Segrais, and Huet, bishop of Avranches.

The chief charitable establishments of Caen are the hospital of the abbey of the Holy Trinity (or, as it is generally called, the Abbey aux Dames), remarkable for the space allowed to every patient, the exquisite neatness of the several departments, and the general excellence of its arrangements; and the establishment of *Le Bon Sauveur*, comprehending a lunatic asylum for both sexes, a dispensary, a deaf and dumb school, a free-school for 120 poor girls, and other establishments.

Caen is the capital of the department, and the seat of a *Cour Royale* or assize court. The arrondissement of Caen had in 1832 a population of 135,502.

CAERLAVEROCH. [DUMFRIESSHIRE.]

CAERLEON, now an inconsiderable town in the parish of Llangattoch, with a population in 1831 amounting to only 1071, is stated to have once been the capital of Wales. It stands on the river Usk in Monmouthshire, and was the Isca Silurum, one of the oldest Roman stations in Britain. A description of the place by Giraldus Cambrensis, in the twelfth century, gives a lively picture of its former importance. It was the seat of an archbishop soon after the introduction of Christianity into Great Britain. The remains of its former importance are extremely scanty, and the chief part of the site of the antient city is now covered with fields and orchards. A space of ground, which it is believed was a Roman amphitheatre, is commonly called Arthur's Round Table. There was formerly an abbey of Cistercian monks at Caerleon. The parish is within the diocese of Llandaff, and the living and rectory of the [illegible] annual value of [illegible]. The population of the whole parish is 1362. There is an [illegible] school at Caerleon, founded by C. Williams, [illegible] fifty boys and girls are instructed. In the [illegible] of the Romans smelting works were carried on in the neighbourhood, and there are at present both iron and tin [illegible]ut the population does not appear to have increased.

[illegible] **MARTHEN, or, in Welsh, CAER FYRDDYN,** the capital of the county to which it gives name, is 218 miles W. or W. by N. of London, through Oxford, Gloucester, Ross, Monmouth, Abergavenny, Brecon, and Llandovery, or about 190 miles direct [illegible]; in 51° 51′ N. lat., 4° 19′ W. long. It is on the [illegible] north-western bank of the river Towy, or Tywi, near [illegible] that river bends to the south to empty itself into Caer[illegible] then is a borough and county of itse[illegible]

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* We state this on the authority of Mr. Dawson Turner, in [illegible]; he mentions that it was expected soon to revert to its original [illegible] place of public worship.

The name of Caermarthen enables us to identify it with the Maridunum (Μαριδουνον) of Ptolemy, one of the towns of the Demetæ (Δημηται), who inhabited the western part of South Wales. In the time of Julius Frontinus, A.D. 70, a Roman station is said to have been founded here, the site of which is supposed to be that subsequently occupied by the castle and its [illegible]ks. The form of the camp is still marked by vestiges of stone and earthworks. The remains of another camp, supposed to have been the *castra æstiva*, or summer [illegible] military on the station, are still visible in a field on the northern side of the town, and several other vestiges of the Roman occupation have been discovered. It was afterwards the residence of the princes of South Wales. At what time the castle of Caermarthen was erected is not known; but in the contests between the neighbouring Welsh chieftains for the possession of the district, and in the wars between the natives and the Anglo-Saxons and Normans, it was a post of importance, and frequently changed hands; in these struggles it suffered much. In the time of Charles I. the castle was garrisoned by the Royalists, from whom it was taken by the Parliamentarians under General Langhorne, or Laugharne. It was probably dismantled shortly afterwards, and allowed to go to decay; part of it was, however, occupied as the county gaol till towards the close of the last century.

The situation of this town is very beautiful, and the inequality of the ground on which it stands gives it a striking appearance when viewed from a distance. But the streets are irregular and steep, and many of them narrow; the principal streets however are well paved, and lighted with gas. The houses are in general whitened, but have chimneys of red brick. The principal edifice is the guildhall in the centre of the town, a large and handsome modern building, raised on pillars, with a covered market underneath. The county gaol occupies part of the site of the castle. This castle was on the brow of a hill rising abruptly from the river: the remains of it, if indeed any exist, are inconsiderable at the present time. There is a good market-place out of the town; and a substantial bridge of several arches over the Towy, by which the road from Swansea enters the town. Though Caermarthen formerly had several parishes, there is now but one. The church, dedicated to St. Peter, is a plain large building, with a square tower. Sir Richard Steele lies buried here, but has no monumental record. The living is a vicarage, formerly in the patronage of the crown, now of the college at Lampeter. There are some remains of the old church of St. Mary, not used for religious purposes since the dissolution of the monasteries, and of two religious houses, a priory of the canons of St. Austin, and a house of Franciscan or Grey Friars.

The population of Caermarthen in 1801 was 5548, but this return has been asserted to be incorrect. In 1831 there were 9955 inhabitants in the parish, of whom 2182 were males of twenty years of age. Of these 2182, 196, or less than one-tenth, were engaged in agriculture; 1079, or nearly one-half, in manufactures, making machinery, in retail trade or handicraft. There are no manufactures of any consequence, except some iron and tin works in the neighbourhood, but the trade of the place is considerable. The quay extends along the banks of the Towy, and was till lately accessible at spring tides to vessels of 300 tons. The vessels which come to Caermarthen are chiefly coasters: the communication with Bristol is great. Vessels from 50 to 150 tons are built here. The town furnishes the populous district with which it is surrounded with various commodities. Among the exports are timber, bark, marble, slates, lead ore, bricks, grain, butter, and eggs. There is a larger proportion than usual of wealthy persons among the shopkeepers and merchants. The market-days are Wednesday, Friday, and Saturday; that on Saturday is the chief corn market, that on Friday is for fish. There are several [illegible] in the year.

Caermarthen has several dissenting [illegible]. There is a grammar-school, endowed by Dr. Owen, bishop of St. David's, in the seventeenth century. The scholars of this school were admitted to holy orders without having to attend the universities before the establishment of the college at Lampeter. There is a Presbyterian college for the education of [illegible] men for the ministry; and there are also Lancasterian, National, and Sunday schools.

The corporation of Caerma[illegible] probably established by Edward [illegible] The governing charter was granted by George III. in 1764. The mayor, recorder, and town-clerk hold a court [illegible] fortnight the business of which is, by custom, chie[illegible] confined to the recovery of debts. There are two general sessions for the town; three of the quarter sessions for the county are held here, and also the assizes. This borough has returned one member to parliament since the time of Henry VIII. Llanelly shares this privilege with it since the passing of the Reform Act.

The county of the [illegible]ugh of Caermarthen includes the parish of Llan[illegible]wch, a [illegible]etual curacy in the patronage of the vicar of St. Peter's church in Caermarthen. Among its corporate officers were two sheriffs, annually elected; but in future, it seems, Caermarthen will have only one sheriff, according to § 61 of the Municipal Corporation Act.

Caermarthen gives the title of marquis to the family of Osborne.

CAERMARTHENSHIRE, a county of South Wales, situated in the western part of that principality, lies between 51° 41′ and 52° 9′ N. lat., 3° 36′ and 4° 47′ W. long. It is bounded on the N. by Cardiganshire, on the E. by Brecknockshire, on the S. E by Glamorganshire, on the S. W. by the sea, and on the W. by Pembrokeshire. Its greatest length is 53 miles, measured E. N. E. and W. S. W. from Egremont on the border of Pembrokeshire to the neighbourhood of Llandulas in Brecknockshire: its greatest breadth, measured at right angles to the above, is about 33 miles, from the junction of the Keach with the Teify to a promontory S. of Llanelly.

The area of the county is not given in the population returns. Mr. Arrowsmith states it in his large map of England and Wales at 974 miles (623,360 acres), which may be considered as near the truth. It is the largest of all the Welsh counties. The population in 1831 was 10[illegible]40.

Surface, Hydrography, Communications.—Caermarthenshire partakes of the mountainous character which is general in Wales, but the elevation of the mountains is not so great as in some other counties. In the northern part of the county a range, distinguished in its different parts by the names of Carreg Wen, Mynydd Castell Newydd, Mynydd allt Walis, New Inn Hill, Llanybyther Mountain, and en Carreg Mountain, runs nearly parallel to the boundary etween this county and Cardiganshire, about four miles ithin the county. This range separates the vale of the eify from that of the Cothy, a feeder of the Towy. The ighest point is probably New Inn Hill, 1168 feet above e level of the sea. Nearly parallel to this range, but ore to the south-east, is another smaller range (Y Graig dy and Van Lansadum), separating the valley of the Cothy om that of the Towy. To the south-east of the last river e have Pembrey Mountain, Bien y Gorse Mountain, Llan[illegible]on Hill (912 feet), and the range of the Mynydd Du, or lack Mountains, of which the highest point, Caermarthenshire Vann, more correctly Y Fan or Ban Sir Gaer (the aermarthenshire Beacon), has an elevation of 2596 feet. esides these there are to the N. E. Talsarn and Trecastle ountains, and several detached eminences.

The principal river of Caermarthenshire is the Tywi or owy, which rises in Cardiganshire in a large morass near r upon the border towards Brecknockshire; flowing southard, and receiving the waters of many brooks, it enters aermarthenshire near the north-eastern extremity of the county. It continues its course southward until it reaches he neighbourhood of Llandovery, near which it receives the united stream of the rivers Braen and Gwydderig, or wthrig, which latter rises in Brecknockshire and flows early in a western direction. The Towy, thus augmented, runs a tolerably direct course to the S. W. past Llangadock and Llandilo-vawr, watering a valley bounded by the mountains already described, the Y Graig Ddy and Van Lansadum on the one hand, and the Mynydd Dû, or Black Mountains, with their branches on the other, and receiving many small feeders on each bank. Below Llandilo-vawr the Towy bends more to the W. and flows to Caermarthen [illegible] bend takes place at Grongar Hill, celebrated by the [illegible] of the poet Dyer. Between Llandilo-vawr and Caermarthen, the Towy receives the waters of the Cothy or Gothy, the most important of its feeders, and the waters of several other streams. From Caermarthen the river flows southward into the bay of Caermarthen, its æstuary being combined with those of the Gwendraeth Vawr and the Tave. The whole course of the Towy is about [illegible] miles, of which about 50 miles are in the county of Caermarthen. The navigable part, which does not appear to extend above Caermarthen town, is about eight or nine miles. This river abounds with fish, especially salmon, sewin, trout, and eels; lampreys and lamperns in the months of June and July. It affords great diversity and beauty of scenery. Its banks are in many places well wooded. The Cothy rises on the border of the county towards Cardiganshire, and has a S.W. course of about 25 miles before its junction with the Towy.

The Tave rises in Pembrokeshire, east of Precelly Mountain, but has only a small part of its course in that county. It flows first to the S.W., then to the S., and then to the S.E. The valley through which it flows is well wooded. It does not receive any considerable feeders until it reaches the village of St. Clears, at or below which it receives the C[illegible]genny and the Cowin or Cowen, which rise in the hills in the north of Caermarthenshire, and flow due south. The Tave becomes navigable at St Clears, and flows into Caermarthen Bay just below the town of Laugharne: its whole course is about 26 or 28 miles.

The Gwendraeth Vawr (or Great Gwendraeth) rises in the hills which occupy the S.E. part of the county towards Glamorganshire, and flows S.W. into Caermarthen Bay. The mouth is much obstructed by the sand, which has, by its accumulation, formed a dangerous bar, much to the injury of the trade of Kidwelly. Its course is only about 1[illegible] miles.

The Lloughor rises in the Mynydd Dû or Black Mountains, and flowing S.W. forms, during the greater part of its course, the boundary between Caermarthenshire and Glamorganshire. It is a very copious stream from its source, near which it has a fall of eighteen feet; and it receives several tributaries. Its æstuary has the name of the river Burry. It is navigable to above Lloughor, which is on the Glamorganshire side. Its length, from its source to the place where the æstuary opens into Caermarthen bay, is about 28 miles. It has been supposed that the Lloughor really issues from a lake near the Caermarthenshire Vann; and the supposition was confirmed by the circumstance that some husks of corn thrown into the lake reappeared six hours afterwards at the apparent source of this river. The Teify divides this county from Cardiganshire.

There are no lakes of any extent in Caermarthenshire. One on Mynydd Mawr (the great mountain) which overlooks the valley of the Towy is of circular form, about half a mile across, and abounds in fine perch and other fish. Another lake of very limpid water lies at the foot of the steep declivity of the Caermarthenshire Vann: it is remarkable for the beauty of the scenery by which it is surrounded. Its greatest depth is sixteen fathoms, and its greatest diameter about a mile: it abounds with fine perch and eels of extraordinary size. It is the source of the Sawddy, a feeder of the Towy.

There are properly only two navigable rivers in the county, the Towy and the Tave: the navigation of the Lloughor and the Gwendraeth Vawr is confined in reality to their æstuaries. There is one short canal, from Kidwelly to Llanelly, with a cut to Pembrey Harbour; one (the Caermarthenshire) railway, sixteen miles long from the limestone quarries of Castell y Garreg to Llanelly, where is a small dock for shipping; and another (the Llanelly) railway, little more than two miles long, with a dock or basin at its termination at Machynis pool near Llanelly. These railroads are chiefly designed for conveying the mineral produce of the country to the sea.

Caermarthenshire is intersected in almost every direction by turnpike-roads. Two mail-roads, both leading to Haverfordwest and Milford, cross the county: one passes through Oxford, Gloucester, and Brecon, enters Caermarthenshire between Trecastle and Llandovery, and runs by Llandovery and Llandilovawr to Caermarthen; the other through Bath, Bristol, Cowbridge, and Neath, enters Caermarthenshire near Pontarddylais, and runs to Caermarthen. This road is the chief communication between Swansea and Caermarthen. From Caermarthen, where these two roads unite, they run by St. Clears and Tavernspite into Pembrokeshire. From Caermarthen a turnpike-road runs N.W. to New Castle Emlyn and Cardigan; and another N.E. to Lampeter. There are roads from Llandilovawr and from Llandovery to Lampeter; from Llandovery to Builth and New Radnor; from Llandilovawr, by Llangadock, to Trecastle, and from Llandilovawr southward to Bettws, and from thence to various parts of Glamorganshire.

Geological character. The southern part of the county bordering upon Glamorganshire and the sea, forms part of the great coal-field of South Wales, the most extensive of the coal-fields of Great Britain, though yet comparatively little worked. The coal is chiefly what is called stone coal: the large coal of this quality is used for drying hops and malt; the small coal, called culm, for burning limestone. Towards the coast the coal is more bituminous. Culm constitutes the principal fuel of the district: it is mixed with clay till it acquires the consistence of mortar, and is then formed into balls of a moderate size, which are piled in the grate and give out a strong heat. Iron-stone is procured from the coal-measures near Llanelly, where are considerable iron-works. The coal-field of South Wales lies in a basin of mountain or carboniferous limestone, and the northern outcrop of this limestone crosses Caermarthenshire in a waving line E. and W. It forms the coast just at the northern part of Caermarthen bay, which divides the coal-field into two parts, separating that which is in Pembrokeshire from that in Caermarthen and Glamorgan shires. From this belt of limestone the farmers of this county obtain their lime for manure. Some marble of a blue colour slightly veined with white, which bears an excellent polish, is quarried in it: it is wrought into chimney-pieces and sent to Bristol. The tombstones in all the neighbourhood are made of it.

The old red sandstone, which rises from beneath the mountain limestone, occupies in the county only a comparatively narrow strip of the surface bounding the coal-field and the limestone district to the north. It widens indeed as it approaches Brecknockshire, where it spreads out so as to occupy the chief part of that county. The Towy above Caermarthen flows near the boundary of the Sandstone belt. Clay slate and grauwacké slate underlie the sandstone, and rising from beneath it occupy the rest of this county, and also those of Cardigan, Montgomery, Radnor, and part of Salop. (Conybeare and Phillips's *Geology of England and Wales*; *Beauties of England and Wales*; Greenough's *Geological Map*; Walker's do.)

Divisions, Towns, &c. Gough, in his additions to Camden, says that Caermarthenshire contains six hundreds; but this is not correct. There are altogether eight hundreds, viz., Cathinog and Cayo in the N., Perfedd in the E., Iskennen in the S.E., Carnwallon and Kidwelly in the S., Derllys in the W. and S.W., and Elvet in the N.W. The three hundreds of Iskennen, Carnwallon, and Kidwelly form a district distinct from the rest of the county, having a coroner of its own.

There are in this county one borough, Caermarthen (population 9955), with its contributary borough Llanelly, six market-towns, besides the two already mentioned; Kidwelly, Laugharne, Llandilo-vawr, Llandovery, Llangadock, and Newcastle Emlyn.

Llanelly is situated upon the river Burry, the æstuary of the Lloughor; it is little more than ten miles from Swansea by Lloughor Ferry. It is irregularly built, but some of the houses are tolerably good. The church, dedicated to St. Elliw, is an irregular edifice with two steeples, one terminated by a spire, the other by an embattled turret.

The population of the principal hamlet (Borough) is 4173; the town and the parish church are in this: the other four hamlets of Berwick, Glyn, Hengoed, and Westfa or Westfae, swell the population of the whole parish to 7646. Llanelly is mentioned as a borough town in the reign of Edward II. It is flourishing, and has an increasing trade. The collieries employ 500 persons; the coal, which is of fine quality, is exported to France and to the Mediterranean for steam-boats. There are some copper works; the ore is imported, and the copper cakes and sheathing exported. There are two iron foundries, but neither of them of much importance. There are three docks for shipping, and a fourth in course of construction. A canal and tram road enable Llanelly to communicate with Kidwelly.

There was before the Reformation a chapel in each of the five hamlets. There are now several dissenting meeting-houses, and several free-schools. Near the town is an antient camp supposed to be British.

Kidwelly or Cydweli, a borough, is upon the Gwendraeth Vechan or lesser Gwendraeth, [illegible] r its junction with the Gwendraeth Vawr. It is divided [illegible] two townships, New Kidwelly, on the eastern or left [illegible] of the river, and Old Kidwelly on the western bank. [illegible] Kidwelly was once surrounded with walls, and had [illegible] e gates: one of these gates is yet standing. this townshi [illegible] decayed, the situation of New Kidwelly being found [illegible] convenient. The trade however of the wh [illegible] declined, owing to the sand obstructing the navigati [illegible] river. The church, dedicated to the Virgin Mary, is in the new town, and is an antique structure, very plain, containing an aisle and two ruined transepts: there is a tower at the western end surmounted by a spire 165 feet in height. There is a good stone bridge over the Gwendraeth Vechan. The antient castle occupies a rocky eminence on the western side of the Gwendraeth Vechan: its external appearance is grand and imposing; it is on the whole in good preservation, several of the apartments being entire, with their arched roofs yet unimpaired, and [illegible] the staircases being in tolerable condition. The magnificent gateway toward the west, which formed the principal entrance, is also yet standing. The ground plan of this castle was nearly square, with a large tower at each corner, and several other towers of smaller dimensions. This fortress is said to have been built about the close of the eleventh century by a Norman knight who had assisted in the conquest of Glamorganshire. There is a free-school, the master of which has a small salary from the corporation. The living is a vicarage in the gift of the king. Leland mentions a cell of black monks of Sherburne as being here in his time; there are some slight remains of this or some other religious house. Kidwelly has several dissenting meeting-houses.

Laugharne is on the right or S.W. bank of the æstuary of the Tave. It is about three miles to the left of the road from London to Milford (turning off at St. Clear's bridge), 12¼ miles from Caermarthen. The town is built on the edge of a marsh, open to the sea, and backed by high grounds: it is of small extent, but contains a considerable proportion of respectable houses. The parish church, dedicated to St. Martin, is large and handsome, and with the church-yard (which is on a declivity, affording a rich view from the upper part) adds greatly to the beauty of this sequestered place. The castle of Laugharne is a very picturesque and noble ruin. When Mr. Malkin visited it in 1803 the proprietor had laid out the inner court as a garden, and filled one of the towers with evergreens and flowering shrubs. It was probably built by some of the Norman lords who invaded this coast soon after the conquest: it was an object of frequent hostility in the wars between the Welsh and the English, and was again contested in the war between Charles I. and the parliament. There are also the remains of a building called Roche's Castle, but supposed to have been really a monastery. Laugharne is well supplied with provisions. So late as the commencement of the present century it was divided into two parts, inhabited respectively by the English and Welsh, who neither mixed together nor even understood each other's language. In 1831 the population of the town was 1423; of the whole parish, 2020. The antient name of this place was Aber Coran (*i. e.*, Coran-mouth), from the Coran or Cowin, which joins the Tave just above it: afterwards it was called Llacharn (or Tâl Llacharn, *i. e.*, 'above the great lake') from which the present name has been by corruption derived. The town of Laugharne is incorporated. The trade of the place, which consists chiefly of the export of butter and corn, is inconsiderable. There are several dissenting places of worship, and some small endowments for education and other charitable purposes. This town was the birthplace of an eminent political and theological writer, Dean Tucker, who died in 1799, aged 87.

Llandilo-vawr, or, as it is usually called, Llandilo, is on the right or N. bank of the Towy, and on the high road through Brecon to Caermarthen and Milford; 15 miles from Caermarthen. The town is delightfully situated, but has little attraction in itself, though considerable improvements have been made: the houses, except those of modern erection, are generally mean, the streets irregular, and the bridge, though not of antient date, inconveniently narrow. The church, in the centre of t[illegible] town, is dedicated to St. Teilo, from whom the town gets [illegible] name (Llan-deilo-vawr or fawr, the church of Teilo the great): it consists of two aisles. The market of this town is considerable: [illegible] is held on Saturday: there are eight annual fairs. [illegible] he quarter sessions are held here once in the year. The liv[illegible] is a vicarage in the gift of the bishop of St. David's: the [illegible] ish, which [illegible] ery extensive, 16 miles from N. to S. and eight fr[illegible] W., is subdivided into [illegible] e town and liberty of Llandilo-v[illegible] r (population 1268), and the hamlets or chapelries of Bryn-y-beirdd (pop. 379); Clynammon (pop. 2[illegible]7); Cwmcawrlwyd (pop. 179); Maenorfabon (pop. 402); Upper Manordilo (pop. 323); Lower Manordilo (pop. 352); Pent[illegible]wm (pop. 206); Taclovan and Rhiewlas (pop.) 221); [illegible]liaris (pop. 207); Trecastle (pop. 377); Tregib (pop. 3[illegible]); and Tyr-escob and Rhosmaen (pop. 636): pop. of the whole parish 5149. There are several dissenting places of worship in the parish, and a small endowed school. Leather and some woollens for home consumption are made in the parish.

Within a short distance of this town on an eminence overlooking the Towy stands the antient castle of Dynevor or Dinas-fawr, celebrated as the residence of the antient princes of South Wales: the remains consist chiefly of two towers, one round, the other square, and the walls surrounding an irregular area. Newton House, the present mansion of Lord Dynevor, is at some distance from the castle in a secluded part of the grounds. Four miles S.E. of the town are the remains of Craig Cenen or Carreg Cennen Castell, on the river Cennen or Kennen. This ruin is considerable, [illegible] several towers and the [illegible] ains of several apartments: th[illegible] date of its origin has [illegible] much disputed. Not far from this is Llanduvaen, a spring once much resorted to on account of its supp[illegible]d medicinal qualities. Before the passing of the Ref[illegible]m Act Llandilo-vawr was the place of election for the county members: it is now only a polling place.

The borough Llandovery is on the Braen, a feeder of the Towy, near the junction of the two, as well as to the junction of the Gwthrig or Gwydderig with the Braen. It is on the road from London to Caermarthen, 27 miles from Caermarthen. The town is pleasantly situated, and has considerably improved of late years. It is in the parish of Llandingad, or Llandingat, the church of which stands in the middle of the town: the name Llandovery is a corruption of the Welsh designation Llan-ym Ddyfri or Ddyfroed, the church among the waters, an allusion to the situation of this church near the three rivers mentioned above. The church has no architectural beauty. There are two bridges over the Towy near the town; one a stone bridge of one arch, the other, began in 1832, a suspension-bridge. There are several dissenting meeting-houses in the town; that of the Independents is very large. There are a national school, an infant school, and several Sunday schools. The population of Llandovery in 1831 was 1706: that of the whole parish of Llandingat 2465. The market on Saturday is well attended. There are six annual fairs. Llandovery was formerly a contributary borough to Caermarthen.

The living of Llandingat is a vicarage, with the chapelry of Llan Fair y Brynn annexed; and is in the gift of the bishop of St. David's. This living was held above two hundred years since by the Rev. Rees Prichard, known as the vicar of Llandovery, and author of a very popular collection of religious poems, called 'Canwyll y Cymry' ('The Welshman's Candle'), but more generally known as 'Llyfr y Ficer' ('the Vicar's Book'): it is the companion to the Bible in almost every Welsh cottage. An endowment left by Mr. Prichard for the maintenance of a free-school has been by some means lost, and the property has reverted to his descendants.

There is supposed to have been a Roman station in the immediate neighbourhood of Llandovery, at Llan Fair y Brynn; and the supposition has been confirmed by the discovery of several Roman antiquities; but the rise of the town of Llandovery is rather to be ascribed to the erection of its castle, which it is likely was built by some of the Norman barons who invaded the country soon after the conquest. The castle was ruined during the civil wars of the 17th century. There are some remains of it on a hill on the west side of the Bran, consisting of part of the keep and some outworks.

Llangadock, or Llan Gadog Fawr, is in the vale of Towy, near the junction of the Sawddy with that river. It is just to the right of a branch-road leading from Trecastle to

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[illegible] tle of Dynevor, and even a part of the town of Llandilo-vawr, are in the [illegible] h of Llandyveyson: population 230.

Llandilo-vawr, about 8½ miles from Llandilo-vawr. It is in a delightful situation, and has a very respectable appearance, several of the houses being good buildings. The church is an old and substantial edifice. There is a modest bridge of five arches over the Towy. There are several dissenting meeting-houses. There was once a baronial castle here, but no part of it now exists. The population of the parish in 1831 was 2476. Coal and limestone are found in the neighbourhood. The coal is sent partly by canal to Swansea, and exported from thence. The living is a vicarage in the gift of the bishop of St. David's. The church is dedicated to St. Cadoc, whence the name of the town is derived.

Newcastle Emlyn is so united with the borough of Adpar in Cardiganshire, that they are usually considered as one town, and both are commonly included under the name of Newcastle. They stand on the banks of the Teify or Teivi; Newcastle on the left or south bank, and Adpar on the right bank, and form an irregular street nearly a mile long. The houses are in general well built. There is no particular trade carried on in the place; but it forms a centre for the sale of cattle for the English market; and in the spring the sea-side barley of Cardiganshire, which is in high repute, is sold here for seed. Stone coal and culm are brought by land from the southern part of the county of Caermarthen, and bituminous coal from Cardigan, to which it is brought by sea. There are eleven cattle-fairs in the year. (*Boundary Reports.*)

Newcastle is 229 miles from London, through Llandovery and Lampeter. It is in the parish of Kennarth, which had, in 1831, 1935 inhabitants, of whom it is likely nearly one half are in the hamlet of Emlyn, which includes the town. The chapel at Newcastle is a neat modern building. There are some dissenting places of worship.

The hamlet of Emlyn, in which Newcastle is, was included by the Reform Act in the borough of Adpar, as contributory to Cardigan. Newcastle was antiently called Dinas Emlyn (city of Emlyn), and took its name of Newcastle from its fortress being rebuilt by Sir Rhys ap Thomas, in the reign of Henry VII. The situation of this castle, on a sort of peninsula formed by a bend of the Teivi, is very picturesque; the arched gateway, supported by two octagon towers, which faces the town, is a striking object. The greater part of the building has disappeared. There is a salmon-leap on the Teifi, a short distance below Newcastle.

The village of St. Clear's, nine miles from Caermarthen towards Milford, exports a considerable quantity of corn, butter, and other agricultural produce. The parish had in 1831 a population of 1083. There are some remains of an alien priory of Cluniac monks formerly existing here, a cell to St. Martin de Campis at Paris. St. Clear's had once a strong castle, the site of which is indicated by an artificial mound of earth.

Divisions for Ecclesiastical and Legal purposes.—This county is in the diocese of St. David's, and for the most part in the archdeaconry of Caermarthen; a very small part is in the archdeaconry of Cardigan. The number of parishes, according to the population returns, is 76; but in the 'Beauties of England and Wales' this statement is charged as incorrect, and the number of parishes is given at 78, with 12 chapelries in addition. The county is in the South Wales circuit; the assizes are held at Caermarthen, also the Epiphany, Easter, and Michaelmas sessions; the midsummer sessions are held at Llandilo-vawr.

Caermarthenshire returns two members to parliament: before the Reform Act it returned only one. Caermarthen with Llanelly returns one member; and Newcastle is united with Adpar (Cardiganshire) as a contributory borough to Cardigan. Caermarthen is the chief place of county elections; the polling stations are Caermarthen, Llandilo-vawr, Llandovery, Newcastle-Emlyn, St. Clear's, Llanelly, Llansawel.

History, Antiquities, &c.—In the most antient period to which the authentic history of this country reaches, it was inhabited by a British tribe, to whom the geographer Ptolemy gives the name of Demetæ (Δημηται), among whose towns he mentions Maridunum (Μαρίδουνον), or Caer-marthen. The Demetæ were subdued, it is likely, by Julius Frontinus, the subjugator of the warlike Silures, the neighbours of the Demetæ. To this Roman general are ascribed two Roman roads, the *Via Julia Maritima*, and the *Via Julia Montana*, which cross this county, the first near the coast, probably through Neath and Loughor (Glamorganshire), and Caermarthen; the second, more inland, by Llangadock and Llandilo-vawr. These roads seem to have united at Maridunum (Caermarthen), and thence to have been continued to the neighbour[illegible] (St. David's), probably in a direction nearly due west. Other Roman roads have been traced. Near Llanboidy, west of Caermarthen, are the remains of a British or Roman camp, at the entrance of which, in 1692, were found 200 Roman silver coins, of early date, buried in two leaden boxes just under the surface of the ground.

Besides Maridunum there seems to have been another Roman station at Llanfair y Brynn, near Llandovery (see above): this station has been ascertained by the number of roads meeting here, and by various Roman antiquities dug up; but its name is not known, though it is supposed to have been of some importance.

After the departure of the Romans this district was included in the principality of Ceredigion (Cardigan); but in the 9th century it was subject to Rhodri Mawr, or Roderick the Great, who united the whole of Wales into one kingdom. Upon the division of his territories among his three sons, Ceredigion, including Caermarthenshire and nearly all the rest of South Wales, fell to the lot of Cadell, the seat of whose government was at Dinas Fawr, or Dinevor, where Rhodri had built a palace.

The division of Wales among the sons of Rhodri was a fatal step; dissensions broke out among the brothers: Cadell conquered Powis (a district between the Wye and the Severn), the heritage of his brother Merfyn. He was himself subsequently attacked by his other brother Anarawd, king of Gwynedd, or North Wales; and in this war Caermarthenshire was ravaged by Anarawd with a powerful force supported by some Saxon auxiliaries. Cadell was succeeded in 907 by his son Hywel, who subsequently united the whole of Wales under his sceptre; and became, under the name of Hywel Dda (or Howell the Good), celebrated as the legislator of his kingdom. A fresh division of the kingdom after Hywel's death brought new troubles; the occasional re-unions which resulted from mere force were not permanent; and to the misery of these civil broils were added the ravages of Danish invaders. In these contests Caermarthenshire had its share; and two remarkable engagements were fought within its borders: one in 1020, at Abergwili, near Caermarthen, in which Llewelyn, at that time sovereign of the whole of Wales, defeated and slew a Scottish adventurer, Run, who, personating one of the Welsh princes, had raised a force among the disaffected chieftains; another in 1021, in which Llewelyn defeated two native princes, who were supported against him by the Irish and Scots, but fell himself in the action through treachery. This battle was fought near Caermarthen. Throughout these contests Dynevor continued to be the seat of government for South Wales.

Some years after the conquest of England by the Normans, the great feudal lords, whose possessions bordered upon Wales, began a series of encroachments upon the principality of South Wales, by which it was gradually reduced to the counties of Caermarthen and Cardigan; even these were for some time in the possession of Henry I. of England. During this possession it is likely that several of the castles built by the Norman barons had their origin; some of them may have been erected during earlier encroachments on the territory. A considerable part of the principality of Dynevor was given up by Henry I. to a Welsh prince who laid claim to it, and whom Henry found himself unable to subdue. This prince appears however to have been a feudal subject of the crown of England. He was subsequently again involved in hostilities with the English. The castles of the Norman lords were several of them taken and partially demolished; some of them were afterwards recovered by the Normans and repaired. Gradually the princes of Wales sunk into the character of subjects of England, and their hostilities with each other and with the neighbouring Norman lords assume more the character of the struggles between a powerful and restless nobility for territory or pre-eminence than of the resistance of one nation to the aggression of another. In the wars between Llewelyn, prince of North Wales, and Henry III., Caermarthenshire became the scene of contest; and in a severe action, the English, who were besieging Dynevor castle, were entirely defeated by the troops of Llewelyn, aided by some chieftains of South Wales. In the final contest between Llewelyn and Edward I. the Welsh were entirely defeated near Llandilovawr, and Llewelyn was subsequently beset by the English and killed while apart from his army. When the complete subjugation of Wales took place in the reign of Edward I., Caermarthen became the seat of courts of law which that prince established for South Wales. The subsequent revolts of the natives were repressed and punished as acts of treason. During the revolt of Owain Glyndwr, at a subsequent period, Caermarthen castle was taken by a body of French sent to support that chieftain.

Of the troublous period which preceded the conquest of South Wales this county possesses several memorials in the baronial castles, the remains of which are so numerous. Those of Caermarthen, Kidwelly, Laugharne, Dynevor, Carreg Cennen, Llandovery, Llangadock, Emlyn, and St. Clear's, have been already noticed. Two call for notice here, Llanstuffan, or Llan Stephan, on a rock of great height on the right bank of the Towy, near its mouth: and Dryslwyn, in the vale of Towy, on the right bank of the river between Llandilovawr and Caermarthen. Llan Stephan castle commands the entrance of the river; and from it there is a fine prospect on the one side towards Caermarthen, and on the other towards Tenby in Pembrokeshire, across a fine bay. The ruins are not very considerable, but they form a most picturesque object, whether viewed from the land or the water; and there is sufficient of them to show that the area enclosed by the castle walls must have been large.

Of the monastic institutions of this county there are scarcely any remains of note. The ecclesiastical ruins at Caermarthen, Kidwelly, and St Clear's, have been mentioned; to these we may add Tallagh or Talley abbey, in the vale of the Gothy, founded by Rhys ap Gruffyd, prince of South Wales, who died A.D. 1197, for Præmonstratensian canons, possessing a gross yearly revenue, at the dissolution, of 153*l.* 1*s.* 4*d.*, or 136*l.* [illegible] 7*d.* clear; and Albalanda or Whiteland Cistertian abbey, on the left bank of the Tave, the time of whose foundation is disputed; its yearly revenue at the dissolution was 153*l.* 17*s.* 2*d.* gross, or 135*l.* 3*s.* 6*d.* clear. Neither of these ruins are remarkable.

In the civil war of the 17th century this county, together with those of Pembroke and Cardigan, was held for the king by Richard Earl of Carberry. The parliamentary forces opposed to him were commanded by General Laugharne who took from the royalists the castles of Caermarther and Laugharne. At a subsequent period Laugharne deserted to the royalists; — upon his defeat with his coadjutors by Colonel Horton, several skirmishes took place in Caermarthenshire as the defeated party retreated towards Pembroke castle, where they were besieged by Cromwell, and forced to surrender.

(*Beauties of England and Wales*; Malkin's *Sketches of South Wales*; Carlisle's *Top. Dict. of Wales*; Arrowsmith's *Map*, and Greenough's *Geological Map of England and Wales*; Conybeare and Phillips's *Geology of England and Wales*; *Parliamentary Reports*; and Paterson's *Roads*.)

Statistics.—Population. Caermarthenshire is chiefly an agricultural county. Of 23,361 males 20 years of age and upwards, residing within the county in 1831, it was found that 12,749 were engaged in agricultural pursuits, and only 292 in manufactures or making machinery. The latter number were chiefly employed in weaving woollens, and were not confined to any particular part of the county, being so dispersed that not more than fourteen weavers resided in any one place. The number of persons so employed was about 260. Machinery for weaving is constructed at Llanelly and Llangeler.

The following summary of the population as it existed in May, 1831, shows the number of inhabitants and their occupations in each hundred, &c., of the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft	All other families not comprised in the two preceding classes	Males.	Females.	Total of persons.	
Carnwallon . . .	2,010	2,157	59	39	665	408	1,084	5,426	5,473	10,899	2,674
Cathinog . . .	1,923	2,039	15	33	1,305	451	283	4,727	4,956	9,683	2,254
Cayo	1,181	1,623	14	43	1,016	311	296	3,885	4,041	7,926	1,916
Derllys . . .	3,061	3,240	33	90	2,003	645	592	7,648	8,275	15,923	3,674
Elvet	2,883	2,995	6	47	1,792	808	395	7,664	8,128	15,792	3,499
Iskennen . . .	1,711	1,835	7	47	1,055	377	403	4,075	4,351	8,426	2,006
Kidwelly . . .	1,924	2,088	16	76	939	437	712	4,858	5,143	10,001	2,305
Perfedd	2,364	2,615	26	88	1,171	863	581	5,821	6,314	12,135	2,851
Caermarthen (borough) . . .	1,563	2,127	10	41	41	999	1,087	4,579	5,376	9,955	2,182
Totals .	18,920	20,719	186	504	9,987	5,299	5,433	48,683	52,057	100,740	23,361

The absolute population of Caermarthenshire at each of the four enumerations made in this century was:—

	Males.	Females.	Total.	Inc. per Cent.
1801			67,317	
1811			77,217	14·70
1821	43,577	46,662	90,239	16·86
1831	48,683	52,057	100,740	11·54

Showing an increase between the first and last enumerations of 33,423 persons, or nearly 50 per cent., which is somewhat below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three periods of

1811 were £23,548 being an average of 6*s.* 1*d.* } for each
1821 „ 27,283 „ 6 0 } inhabi-
1831 „ 33,598 „ 6 8 } tant.

The sum expended for this purpose in the year ending the 25th March, 1834, was 33,755*l.* 4*s.*, which on the supposition that the population has gone on increasing since 1831 at the same rate of increase as in the ten preceding years, is an average of 6*s.* 5*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised within the county for poors' rate, county rate, and other local purposes, in the year ending 25th March, 1833, was 44,587*l.* In the same year there was expended—

	£.	*s.*
For the relief of the poor . .	36,251	19
In suits of law, removal of paupers, &c.	1,377	4
For other purposes	7,363	15
	£44,992	18

The descriptions of property assessed for local purposes are not distinguished in the returns made up for the year ending March, 1834. The total amount levied in that year was 43,994*l.*, and the expenditure was as follows:—

For the relief of the poor	33,755	0
In suits of law, removal of paupers, &c.	1,850	3
For other purposes	7,807	17
	£43,413	4

A saving has therefore been effected of nearly 7 per cent. in the expense of relieving the poor, but the other expenses have increased, and therefore the saving on the whole amount is only about 3½ per cent.

The number of turnpike trusts in Caermarthenshire, in 1829, was 10, and the length of roads under their charge 319 miles: the annual income arising from the tolls and parish composition was 7118*l*., and the annual [illegible] 6148*l*.

The county expenditure for various purposes, exclusive of the relief of the poor, was 2480*l*. 0*s*. 11½*d* in 1833. The sum levied for county rate, in 1833, was 4500*l*.

The number of persons charged with criminal offences in Caermarthenshire, in the three septennial periods ending with 1820, 1827, and 1834, were 164, 147, and 268 respectively, being an average of 23 annually in the first period, of 21 in the second, and of 38 in the third period. The numbers of persons tried at quarter-sessions in 1831, 1832, and 1833, were 23, 33, and 11 respectively. Of these the number who had committed

	1831.	1832.	1833.
Felonies were	17	18	6
Misdemeanors	6	15	5
Of whom were convicted	11	23	4
Acquitted	12	10	7

The total number of persons charged with crimes at the assizes and sessions, in 1835, was 38; of these 4 were offences against the person, 8 against property committed with violence, and 26 offences against property committed without violence; of which 19 were cases of simple larceny, 1 of arson, 6 of robbery and housebreaking: there were 3 cases of murder. Of the persons charged with offences only 3 were females.

Of these, 14 could read and write, 5 could read only, and 16 could neither read nor write, in which latter number all the females are included; the degree of instruction of the remaining 3 could not be ascertained. The proportion of the offenders to the population in 1835 was 1 in 2651.

There is one savings-bank in the county; the number of depositors and amount of deposits on the 20th November, 1832, 1833, and 1834, were respectively,—

	1832	1833	1834
Number of depositors	281	259	278
Amount of deposits	£8535	7653	7902

Education.—The following abstract of the number of schools, &c., in Caermarthenshire, is taken from parliamentary returns on the subject given in 1835:—

	Schools	Scholars	Total.
Infant Schools	5		
Number of infants at such schools, ages from 2 to 7 years, sex not specified		130	
			130
Daily Schools	161		
Number of children at such schools, ages from 4 to 14 years:—			
Males		1924	
Females		1182	
Sex not specified		2769	
			587
Schools	166		
Total of children under daily instruction			6005
Sunday Schools	207		
Number of children and others at such schools:—			
Males		3771	
Females		3101	
Sex not specified		11,544	
			18,416

Those children who are both in the Sunday schools and the day schools are entered twice in the foregoing abstract.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	
Infant Schools	—		1	40	4	90	
Daily Schools	20		13	838	122	3984	308
Sunday Schools	3		198	17,648		364	88
Total...	23	1061	212	18,526			396

Schools established by Dissenters included in the above.

	Schools.	Scholars.
Infant schools	—	—
Daily schools	11	400
Sunday schools	138	12,739

Two boarding schools are included among the 161 daily schools.

The schools established since 1818 are—

Infant and other daily schools 65, containing 2945 scholars.

Sunday schools . . . 178, „ 15,668 „

Lending libraries of books are attached to four schools in the county.

CAERNARVON, or CAER-YN-ARFON (the town fortress in Arfon), a town in North Wales upon the Menai Strait, the capital of the county to which it gives name, 235 miles from London, by Shrewsbury and Bala. It is in 53° 9′ N. lat. and 4° 14′ W. long.

The remains of the Roman station Segontium (*Itin. Anton.*), known by the name of Caer-seiont, are intersected by the road leading to the church of Llanbeblig, in which parish Caernarvon stands. They are about a mile from the town, and consist of some fragments of the wall. The inclosure was of an oblong form, and comprehended about six or seven acres, on the summit of a small elevation on the east or right bank of the river Seiont. A Roman road is still traceable leading to Dinas Dinorddwig, a Roman station a few miles to the E. On the west bank of the Seiont is a Roman fort still nearly entire. The walls are about 11 or 12 feet high and 6 feet thick, with three parallel rows of circular holes about three inches in diameter running all round the walls. Where the facings are dilapidated the peculiarity of Roman masonry is easily discoverable. Near one corner of the work is a heap of stones which once formed a circular tower, and the foundations of similar towers are visible at the other corners.

The present town of Caernarvon is probably the representative of the native town, which was adjacent to the Roman station. The situation appeared to Edward I. a favourable one for erecting a fortress to curb his newly conquered subjects, the Welsh. In 1282 he commenced the building of Caernarvon castle, and it has been said, notwithstanding its extent, to have been built within a year; a more authentic record, however, speaks of its building as having occupied twelve years, and the revenues of the archbishopric of York (which was kept vacant for a time to serve this turn) were appropriated to defray the cost: the walls of Segontium furnished a part of the materials; limestone was brought from Anglesey, and other materials from Vaenol, between Caernarvon and Bangor. John de Havering was appointed the first governor, and was to keep up a garrison of 80 men. In this castle, in 1284, the first English 'Prince of Wales,' afterwards the unhappy Edward II., was born.

Upon a rising of the Welsh in 1294, under Madoc, an illegitimate son of Llewelyn, prince of Wales, Caernarvon castle and town were taken by the insurgents, the English inhabitants massacred, and the place burnt. In the insurrection of Owain Glyndwr it was defended for the king Henry IV. by two Welsh captains, to whom it had been intrusted. In the civil war of Charles I. and the parliament the castle, which was in the hands of the royalists, was taken by captain Swanley, a parliamentarian, with 400 prisoners and a quantity of arms, ammunition, and other booty. It was soon however retaken by the royalists. In 1646 it was again besieged by the parliamentary forces under generals Mytton and Laugharne; and Lord Byron, the governor, was reduced to surrender, though upon honourable terms. In 1648 General Mytton was besieged here by a force under Sir John Owen, but the approach of a superior force obliged Sir John to raise the siege, and his defeat shortly afterwards led to the entire submission of North Wales to the parliament.

Caernarvon occupies a peninsula formed by the Menai strait on the north and west sides, and the Seiont on the south. The town is walled: the walls are defended by round towers, and had originally only two gates: other openings have been subsequently made to form a communication with the suburbs on the east, which have so far increased as to make a new town. The town walls unite with the castle, which is on the south side of the town on the banks of the Seiont; the streets are narrow but regularly laid out, crossing at right angles, and are well paved and lighted. The quay is on the south side of the castle, extending along the Seiont, and there is a terrace outside the town wall and along the shore of the Menai, extending from the quay to the north side of the town. There is also a pier projecting into the Seiont.

The town-hall is over one of the antient gates of the town. The county hall, in which the assizes are held, is a commodious building inside; the county prison is small. There are a new market-house and a corn-market, formerly used as the general market-house and shambles. The chapel of ease for Caernarvon is in the parish of Llanbeblig, (the church of which is at some distance), and has been much enlarged and improved of late years.

The external walls of the castle are nearly entire, enclosing a space of three acres, of an oblong shape: they are from eight to ten feet thick, and have within their thickness a covered gallery with loop-holes for the discharge of arrows. There are in the circuit of the walls numerous embattled towers with turrets: these towers are by no means of uniform shape, some are pentagonal, while others have six or eight sides. The Eagle tower, so called from the figure of an eagle carved on it in stone (supposed to be of Roman origin and transported here from the ruins of Segontium), contained the apartment in which Edward II was born. The principal entry to the castle is by a gateway originally defended by four portcullises, under a massy tower, on the front of which is a statue of Edward I. in a menacing posture; another is called Queen's-gate, from Eleanor, the queen of Edward I., having entered by this gate when she came here to lie in. The interior of the castle is much dilapidated.

The population of the parish of Llanbeblig in 1831 was 7642, of whom the bailiffs computed 6877 to be within the boundaries of the borough of Caernarvon, but these boundaries extend in some directions two miles from the town There is no manufacture of any importance: the chief trade is the exportation of copper ore and of slates from the quarries of Llanberris and Llanllyfni in the interior. The trade has been much enlarged since the removal of the coast duty upon slates. Some coast trade is carried on with Liverpool, Bristol, London, and Ireland, and there is a little foreign trade. The port has been much improved, and there is a rail-road from the slate-quarries of Llanllyfni to the town. Carlisle's 'Top. Dict. of Wales' assigns to Caernarvon two weekly markets, Wednesday and Saturday, but other authorities speak only of the Saturday market. There are five annual fairs. Some of the inhabitants are engaged in fishing.

Caernarvon is resorted to as a bathing-place, and many genteel families reside in the town and neighbourhood. There is a handsome hotel built by the marquis of Anglesey, with sea-water baths attached to it. There is also a small theatre, a large national school, and several dissenting meeting-houses.

Caernarvon received the first royal charter which Edward I. granted to Wales. The mayor is, for the time being, deputy-governor of the castle. Caernarvon, in conjunction with its contributory boroughs, Pwllheli, Nevin, Criccieth, Conwy, and Bangor, (the last added by the reform act,) sends one member to parliament. (*Beauties of England and Wales*; Bingley's and Evans's *Tours*, *Population Returns*, *Boundary Reports*.)

CAERNARVONSHIRE is situated at the extremity of the main land of Wales, being farther to the N.W. than any other county, except the island of Anglesey. It is between 52° 47′ and 53° 21′ N. lat., and 3° 40′ and 40° 45′ W. long., and is bounded on the N. by the Irish sea; on the N.W., by the Menai strait, which separates it from Anglesey, and by Caernarvon bay: on the S., it is bounded by the great bay of Cardigan, which forms on this coast the smaller bays of Aberdaron, Hell's Mouth, Ceiriad Road, and St. Tudwal's Road: on the S.E. it is bounded by Merionethshire, and on the E. by Denbighshire, from which, for a large part of the boundary, it is separated by the river Conwy. Caernarvonshire is thus on every side, except the E. and S.E., washed by the sea; and toward the land the boundary is for the most part formed by two streams, the Conwy and another stream which separates Caernarvonshire from Merionethshire. There are three detached portions on the east or Denbighshire side of the Conwy: one of these, at the mouth of the river, comprehends the promontories of Great Orme's Head and Little Orme's Head. The form of the county is an irregular oblong, having its greater diameter or length from N.E. to S.W., 54 or 55 miles; and its greatest breadth, at right angles to the above, about 21 or 22 miles. The county contains 544 square miles, or 348,160 acres. It is the smallest of the Welsh counties, with the exception of Radnor, Anglesey, and Flint. The population of the whole county in 1831 was 66,500.

Coast and Islands, Surface, Hydrography, and Communications.—There are no remarkable headlands on the coast, except Great Orme's Head, near the mouth of the Conwy. Penmaen-mawr, a lofty mountain, rises abruptly from the beach, between Conwy and Bangor; the high road winds along its side. From the foot of Penmaen-mawr the Lavan sands extend towards Bangor, and contract the navigable part of the otherwise wide N.E. entrance of the Menai channel. S.W. of Caernarvon a tongue of low land projects into the Menai, and, with its connected sands, narrows the navigation of that channel in the S.W. entrance. For several miles S.W. from this tongue of land the shore is low, but though the mountains afterwards approach the sea, the shore is not steep until we approach the S.W. extremity of the county, where the Braich y Pwll, the promontory of the Cancani (Καγκανῶν ἄκρον) of Ptolemy abruptly rises from the ocean. Before reaching this craggy coast, there are numerous little creeks or inlets which form safe retreats for the fishermen of the coast; about this part is abundance of samphire, which sheep and cattle eagerly feed on and grow very fat. The fish caught hereabouts are the herring, the lobster, and the dory. Opposite to the headland of Braich y Pwll is the small island of Bardsey, on which was a religious establishment of very early date.

The south-eastern boundary of the county between the two extremities is more irregular than that to the N.W.: nearly half of it is washed by the sea. From Braich y Pwll eastward are the bay of Aberdaron, the headland of Penrhyn, with the island of Ynys Gwylan, the dangerous bay of Hell's Mouth, and the headland Penrhyn Dû. From this headland the coast stretches to the N.E., being for the most part low and sandy, especially at the point where Caernarvonshire and Merionethshire meet, where a sandy inlet or wash is traversed by one or two streams which here find an outlet to the sea. Across these sands, a portion of which have been reclaimed from the sea, is a passage dangerous indeed, but shorter than round the head of the inlet. Not far from the promontory of Penrhyn Dû are the two small islands of St. Tudwal: on the larger of the two, now inhabited only by sheep and rabbits, and, in the season, by puffins, was formerly a religious house dedicated to St. Tudwal.

Caernarvonshire is traversed in its whole length by mountains, some of which are the loftiest in South Britain. From the western side of the mouth of the Conwy the mountains run S.W., receding gradually from the coast, and presenting in succession the following summits: Tal-y-Fan and Penmaenmawr (1540 feet), Carnedd Llewelyn (3471 feet), Carnedd Dafydd (3429 feet), Glider Vechan and Glider Vawr, Snowdon (3557 feet, the highest mountain in South Britain). From Snowdon the mountains vary their direction a little, so as gradually to approach the coast; the chief summits are Craig Goch, Bwlch Mawr (1673 feet), Gyrngoch, and Rivell (1867 feet), which is close upon the shore. These summits may be considered as belonging to the main range of the Caernarvonshire or Snowdonian mountains. From the main mass of Snowdon a branch, running in the direction of the town of Caernarvon, has the summit Moel Eilio (2366 feet). Other branches from the central mass occupy the greatest part of the interior of the county, and extend into Merionethshire.

The following description of Snowdon is from Mr. Pennant's *Tour in Wales* (vol. ii. p. 170 *seq.*, 2nd edit. Lond. 1784). 'In the course of our ascent saw on our left above the *cwm* (valley) *Moel-y-Cynghorion*, or *the Hill of Council*. Pass through *Bwlch y Maes cwm*, and skirt the side of Snowdon till we reach *Bwlch y Cwm Brwynog*, where the ascent becomes very difficult by reason of its vast steepness. People here usually quit their horses. We began a toilsome march, clambering among the rocks. On the left were the precipices over *Cwm Brwynog*, with *Llyn* (the pool) *du yr Arddwy* at their foot: on our right were those over the small lakes *Llyn Glas*, *Llyn y Nadroedd* and *Llyn Coch*. The last is the highest on this side of the mountain, and on whose margins we were told that, in fairy days, those diminutive gentry kept their revels. This space between precipice and precipice forms a short and no very agreeable isthmus, till we reached a verdant expanse which gave us some respite before we laboured up another series of broken crags: after these is a second smooth tract, which reaches almost to the summit, which, by way of pre-eminence, is styled *Y Wyddfa*, or *the Conspicuous*: it rises almost to a point, or, at least, there is but room for a circular wall of loose stones, within which travellers usually take their repast.

'The mountain from hence seems propped by four vast buttresses, between which are four deep *cwms* or hollows; each, excepting one, had one or more lakes lodged in its distant bottom. The nearest was *Ffynnon Las*, or *the green* *well*, lying immediately below us. One of the company had the curiosity to descend a very bad way to a jutting rock that impended over the monstrous precipice, and he seemed like Mercury ready to take his flight from the summit of Atlas. The waters of Ffynnon Llas from this height appeared black and unfathomable, and the edges quite green. From thence is a succession of bottoms surrounded by the most lofty and rugged hills, the greatest part of whose sides are quite mural, and form the most magnificent amphitheatre in nature. The *Wyddfa* is on one side; *Crib y Distill*, with its serrated tops, on another; *Crib Coch*, a ridge of fiery redness, appears beneath the preceding; and opposite to it is the boundary called *Lliwedd*. Another very singular support to this mountain is *Y clawdd Coch*, rising into a sharp ridge, so narrow as not to afford breadth even for a path.

'The view from this exalted scene is unbounded. In a former tour I saw from it the county of Chester, the high hills of Yorkshire, part of the north of England, Scotland, and Ireland; a plain view of the Isle of Man; and that of Anglesey lay extended like a map beneath us, with every rill visible. I took much pains to see this prospect to advantage; sat up at a farm on the west till about twelve, and walked up the whole way. The night was remarkably fine and starry; towards morn the stars faded away, and left a short interval of darkness, which was soon dispersed by the dawn of day. The body of the sun appeared most distinct, with the rotundity of the moon, before it rose high enough to render its beams too brilliant for our sight. The sea, which bounded the western part, was gilt by its beams, first in slender streaks, at length glowed with redness. The prospect was disclosed to us like the gradual drawing up of a curtain in an amphitheatre. We saw more and more, till the heat became so powerful as to attract the mists from the various lakes, which in a slight degree obscured the prospect. The shadow of the mountain was flung many miles, and showed its bicapitated form; the Wyddfa making one, Crib y Distill the other. I counted this time between twenty and thirty lakes, either in this county or Meirionydd (Merioneth) shire. The day proved so excessively hot, that my journey cost me the skin of the lower part of my face before I reached the resting-place, after the fatigue of the morning.

'On this day the sky was obscured very soon after I got up. A vast mist enveloped the whole circuit of the mountain. 'The prospect down was horrible. It gave the idea of a number of abysses, concealed by a thick smoke, furiously circulating around us. Very often a gust of wind formed an opening in the clouds, which gave a fine and distinct vista of lake and valley. Sometimes they opened only in one place; at others in many at once, exhibiting a most strange and perplexing sight of water, fields, rocks or chasms in fifty different places. They then closed at once, and left us involved in darkness; in a small space they would separate again, and fly in wild eddies round the middle of the mountains, and expose, in parts, both tops and bases clear to our view.'

The name of Snowdon is the Saxon translation (Snap-bune, snow-mountain) of the antient Welsh name Creigie 'r Eira, according to Pennant.

From the small size and peninsular form of this county, and the consequent nearness of the mountains to the sea, the rivers are small though very numerous. Many of them rise from or expand into lakes, which bear the general native name of Llyn, lake or pool.

The Conwy or Cyn wy, *i. e.* 'chief water' (the Toisobius of Ptolemy), rises in that part of the county which lies between Merioneth and Denbighshire. Llyn Conwy, from which it flows, is one of the largest sheets of water in the county, being about a mile long and three-quarters of a mile broad, surrounded with deep bogs and masses of rock, and producing a sort of char or red trout. From the south corner of this lake the river flows with great rapidity, and making a circuit runs first north-east and then north-west, being swelled by many small streams from the neighbouring hills,—the Serw from Llyn Serw, the Clettwr, and the Avon Hwch, on the right; the Machno, and the Ledau or Lleder, on the left. The fall of the Machno forms one of the finest though not the largest cataracts in Wales: close to the junction of this stream there are two falls of the Conwy, one above the junction, and one below. There are rapids in the Lleder just above its junction. From the junction of the Lleder the Conwy turns to the north, which continues to be its general direction, till its outfall. It receives on the left the Llugwy, which rises in Ffynnon Llugwy, under the mountain Carnedd Dafydd, and receives the water of two small lakes near Capel Curig. This Llugwy forms several very picturesque falls a few miles below Capel Curig. Below the junction of the Llugwy the Conwy passes the town of Llanrwst (Denbighshire), where the navigation commences, and receives on the left several streams which flow from the llyns or lakes of Caernarvonshire, and render it navigable to vessels of above 100 tons, with freights of timber and slates. Near its outfall the river widens into an æstuary, and flows under the walls of Conwy Castle into the Irish Sea. Its length is about 28 or 30 miles, for 12 or 13 of which it is navigable.

The Glas Llyn rises from the Ffynnon Llas, and flows for the most part to the south-west into Cardigan bay, between Cricceith (Caern.) and Harlech (Merioneth.). Near its source it forms a cascade of about 300 feet, and is altogether one of the most romantic rivers of Wales. It passes through Llyn Gwynan and Llyn y Dinas, two lakes in a most beautiful valley. The sands at the mouth of this river were very extensive, forming a wash called Traeth Mawr, which was dangerous to passengers. In 1625 a design was formed for an embankment, which should shut out the sea and gain this extent of surface for agricultural purposes. The design was not carried into effect then, but has been since executed by a private individual, W. A. Madocks, Esq. The whole course of the Glas Llyn is about 16 or 17 miles. It is navigable to Pont Aberglasllyn.

The Gwrfai rises on the west side of Snowdon, and flows north-west through Llyn Cywellyn into the Menai, south-west of Caernarvon. The Seiont, rising from the same mountain, flows in a similar direction through the two lakes of Llanberris into the Menai at Caernarvon: the Llyfni, which has its source also in Snowdon, flows west through lake Llynnieu-Nanlle into Caernarvon bay: and the Ogwen rises in Mount Trevaen, and flows through Llyn Ogwen into the Menai near Bangor. The Seiont, which has probably the longest course, hardly exceeds 15 miles in length.

'The quantity of water,' says Mr. Pennant, 'which flows from the lakes of Snowdonia is very considerable; so much, that I doubt not but collectively they would exceed the waters of the Thames, before it meets the flux of the ocean.'

There are no canals in Caernarvonshire. A rail-road connects the Penrhyn slate quarries with Port Penrhyn, near Bangor; and another connects the slate quarries of the vale of Nanlle with Caernarvon. The parliamentary road from London through Shrewsbury to Holyhead crosses the county in a north-west direction from the river Conwy, near Bettws y Coed, to the suspension-bridge over the Menai near Bangor. From this road there is a branch on the right from Bettws to Llanrwst and Conwy, and another branch on the left from Capel Curig to Caermarthen. The mail road from Chester to Holyhead enters this county at Conwy, where it crosses the river by a new suspension-bridge, and runs along the side of Penmaen-mawr to Bangor, with a branch from Bangor to Caernarvon. The road from London through Bala to Caernarvon runs N.N.W. from Pont Aberglasllyn and Beddgelert to Caernarvon.

Geological and Mineralogical character.—Along part of the coast of the Menai channel there is a narrow strip of carboniferous limestone, which also forms the Great and Little Orme's Head. A narrow belt of rocks, continually varying in composition, skirts the carboniferous limestone on the land side, as to its geographical position. Within this again we meet with the old red sandstone, which extends along the coast beyond the limits of the limestone, on the north-east from Bangor to Conwy, and on the south-west to beyond the point where the Menai strait opens into the bay of Caernarvon; it appears again just by Braich y Pwll, which headland is formed by it. The other parts of the north-west coast, the plains from the shore to the foot of the mountains, and the banks of the Conwy, are occupied by argillaceous schist, comprehending the clay-slate and grey-wacké-slate of some geologists; and other primitive rocks subjacent to this form the summits of the mountains.

'The greater part of the rocks composing the Caernarvonshire mountains are schistose hornblende, schistose mica, granite, and porphyry, including considerable blocks of quartz. The western side (of Snowdon) by which we descended is very precipitous, consisting of hornstone, upon which are placed a number of basaltic columns, more or less regularly pentagonal, standing perpendicularly to the plane of the horizon.' The columns are of different lengths, about four feet diameter, with transverse joints from six to eight feet asunder, and considerable depositions of thin laminated quartz in the joints.' (*Journal of a Tour through North Wales, &c.,* by Arthur Aikin, London, 1797.)

'If from the central ridge of the Snowdon chain (in which term I comprehend the whole mountainous extent of Caernarvonshire from north to south) we proceed to the Menai, it will be found that the primitive rocks in mass, such as the granites and porphyries, occupy the interior and higher peaks; to the side of these are applied the primitive stratified rocks, then come the slates, which terminate in the limestone which forms the bank of the Menai. The same gradation of strata will appear, if, instead of the western we examine the eastern side of Snowdon' (*i. e.*, towards the Conwy). 'The variation indeed is not so sudden, but perhaps on that very account is more interesting, as the species and varieties of rocks are more numerous, and in larger masses. From the peak of Snowdon to Llanrwst through Capel Curig are found granite and porphyry in mass, micaceous schistus, and other primitive stratified rocks; serpentine in large blocks and of extraordinary beauty, and hornblende slate mingled with veins and rocks of quarts; from the vale of Llaurwst to Llangollen,' *i. e.*, along the valleys of the Conwy and the Dee, 'extend the slates which are there (at Llangollen) circumscribed by the limestone range already mentioned.' (Aikin.)

It will be observed that Mr. Aikin does not notice the old red sandstone which underlies the carboniferous limestone, and rises from beneath it along the banks of the Menai. There is a considerable difference between the chief authorities which we have followed as to the geological character of the shore of the bay of Cardigan. Mr. Aikin describes it as composed of limestone, while in Mr. Greenough's map there are no indications of that rock. The omission of all notice of the sandstone, by Mr. Aikin, causes also his account of the north-west coast to differ materially from Mr. Greenough's map.

There are copper-mines at Great Orme's Head, in the vale of Conwy a little west of Llaurwst, in the vale of Llanberis, and near Pont Aberglasllyn. Lead and calamine are obtained in the vale of Conwy near the junction of the Llugwy with the Conwy, and in that part of the county which lies east of the Conwy. Millstones are dug in the vale of Conwy. Slates are found in various parts of the county, and form one of the chief articles of export. The finest are those on the west side of the ridge of the Snowdonian mountains, and they become finer as they descend towards the sea. Not only roofing-slates and writing-slates are procured from these mines, but inkstands and other fancy articles are made. Slabs are procured large enough for tomb-stones and paving-slabs.

Divisions, Towns, &c.—Caernarvonshire is divided into ten hundreds. The south-west extremity of the county is occupied by the hundred of Commitmaen or Cymytmaen; adjacent to this are the hundreds of Dinlaen or Dinlleyn on the north-west coast, and Gafflogian or Gyflogion on the south-east; the hundred of Evionydd or Yfionydd, occupies the remainder of the coast of Cardigan bay; and those of Uwch-Gorfai or Gwrfai, Is Gorfai or Gwrfai, and Llechwedd Uchaf, occupy the north-west coast, each extending far inland: the upper part of the vale of the Conwy is occupied by the hundred of Nant Conwy, the lower part by that of Llechwedd Isaf; and the parts on the coast east of the Conwy form the hundred of Creuddyn.

The county town is Caernarvon (population in 1831, 6877), on the shore of the Menai Strait, 235 miles north-west of London. There is one city, Bangor (population in 1831, of city and parish, 4751), and four market-towns, Pwllheii, Conway or Conwy, Nevin or Nefyn, Crickeith or Cricceith, and the newly-built town of Tremadoc.

Pwllheli, on Cardigan bay, has a small port formed by the æstuary of three or four small streams, and consists of one long well-built street. 'The town appears to be flourishing; we observed some new buildings in progress; there are some subscription building-clubs in the town, and it is proposed to erect a new church, a subscription for that purpose having been raised.' (*Boundary Reports.*) The harbour has at its entrance a round rock, called Careg yr Imbill, about a mile from the town, to which it is joined by a range of sand-hills; vessels of about 60 tons find the harbour good. A considerable coasting trade is carried on. The exports are chiefly provisions; the imports are coals, cotton goods, and various articles of consumption from Liverpool, and limestone and a few articles from South Wales. The market is large; the market-days are Wednesday and Saturday; and there are six annual fairs.

Pwllheli is in the parish of Denio, which had in 1831 a population of 2091. The town has a corporate charter, granted by Edward prince of Wales (the Black Prince), and confirmed by Edward III. It is a contributory borough to Caernarvon.

Conway, or more properly Conwy, or, as it is sometimes called, Aber-Conwy (Conwy-Mouth), is, as its name imports, near the mouth of the Conwy, on its left bank, 223 miles N.W. of London by Whitchurch, Wrexham, Mold, and Denbigh, which is the shortest road.

Some antiquaries have proposed to fix here the Conovium of Antoninus; but the general opinion identifies Conovium with Caer-Rhun, five miles higher up the river. Edward I. completed a castle in 1284, which he built in order to bridle his new subjects the Welsh. Soon after its foundation, A.D. 1290, the king was besieged here by the natives, in their revolt under Madoc, an illegitimate son of Llewelyn, and reduced to great extremity by famine before the place was relieved by the arrival of a fleet with provisions. When Richard II. mustered his forces to oppose his rival Bolingbroke (afterwards Henry IV.), after disgusting his adherents and weakening his forces by delay and fickleness, he on a sudden quitted his army by night and privately sheltered himself in Conwy Castle, from whence he was soon afterwards allured and delivered into the power of his enemies. In the civil war of Charles I. the castle was garrisoned for him by Williams, archbishop of York, who appointed his own nephew governor. Irritated however at being superseded in the command of North Wales by Prince Rupert, the archbishop went over to the side of the parliament, and assisted their general, Mytton, in the reduction of the town and castle. The town was stormed in August, 1646, and the castle surrendered in the following November. All the Irish among the prisoners were tied back to back and thrown into the river. The parliament respected this noble edifice when they dismantled most other castles in Wales; but the roofs and floors were afterwards removed by the Earl of Conwy, to whom, after the Restoration, it was granted. One of the towers has a large breach in the lower part, caused by the inhabitants undermining it while digging for slates. The strength of the masonry has kept the upper part in its place. It is to be regretted that the practice of excavating the rock on which the castle stands is still carried on, to the endangering of the walls and apartments.

This fortress, one of the noblest piles in Britain, is in form nearly a parallelogram, extending along the verge of a precipitous rock on the S.E. side of the town: two of the sides are within the walls of the town: the others are washed, one by the Conwy, which here expands into an æstuary, the other by a small stream which flows into the Conwy. The walls, which are partly covered with ivy, are of great thickness, twelve to fifteen feet, flanked on each of the two sides without the town by four vast circular embattled towers with slender turrets rising from them. The grand entrance was on the W., towards the town, but there was a communication with the river by small advanced work and a narrow flight of steps cut out of the rock. The interior consists of two courts; the apartments are not traceable, except in a few instances. Ruinous arches and broken walls covered with ivy indicate the extent and greatness of the state hall, 130 feet or more in length, 32 broad and about 30 high.

The town is still surrounded by its antient walls, which are strengthened at intervals by 21 towers, besides two towers to each of the three entrances. The enclosure of the town walls is triangular, having the castle at one angle; and in the picturesque beauty of its situations few places can equal Conwy. The streets of the town are narrow, many buildings in a ruinous condition, and vacant spaces in the streets show where others have stood. The church, which stands near the centre of the town, was once the conventual church of a Cistertian abbey, founded here, A.D. 1185, by Llewelyn ap Jorwerth, prince of Wales. Of the three gates, one on the E. communicates with the quay and tideway of the river; the W. gate is towards Bangor and Holyhead; that on the S. communicates with a bridge over the creek that washes on one side the base of the castle rock.

In the river, about 100 yards from the rock on which the castle stands, is an insulated rock, eastward from which, for about half a mile, extend sands covered by the sea when the tide is up, but dry, with the exception of a narrow channel, at low water. When the improvement of the communication with Ireland was under the direction of the parliamentary commissioners, it was determined to throw a suspension bridge from the castle rock to that in the river (between which rocks is a deep and rapid tideway), and to connect the latter with the eastern shore by an embankment across the sands. The works were begun in 1822 and finished in 1826. The width of the bridge, measured between the centres of the supporting towers, is 327 feet; the height of the underside of the roadway above the high water of spring tides 15 feet; the embankment, which is of mountain clay faced with stone, is 2015 feet in length, and averages 9 feet in height above the high water of spring tides, rising to 13 feet at the end next the bridge; the width of the base at the highest part is 300 feet, the breadth at the top 30 feet. The spring tides in this river rise 21 to 24 feet. The architecture of the supporting towers of the bridge is in keeping with that of the venerable castle, to which the western tower is adjacent. (*Account of the Menai Bridge, and Notice of Conway Bridge*, by W. A. Provis, Lond. 1828.)

Its situation on so important a thoroughfare is the chief support of Conwy. There is little trade in the town, which is considered to be in a decayed state, with little prospect of any revival, unless by the increase of the trade in slates quarried in the Caernarvonshire hills. The port is frequented by a few coasting vessels, and some timber and slate are exported. The market is on Friday, and there are four annual fairs. Pop. in 1831, 1245.

The town was incorporated by charter of Edward I. It is governed by a mayor, who is constable of the castle, a recorder, two bailiffs, and other officers. It is a contributory borough to Caernarvon. The living is a vicarage in the gift of the bishop of Bangor. There are some dissenting places of worship, and a school without endowment, for the gratuitous instruction of the poor. (See the *Hist. and Antiquities of Aberconwy, &c.*, by the Rev. Robert Williams, Denbigh, 1835.)

Pearl oysters are found in the Conwy near this town.

Nevin or Nefyn lies on a small bay on the N.W. coast of the county, 21 miles from Caernarvon along the coast. It was made a free borough by Edward the Black Prince at the same time as Pwllheli. Edward I. had previously held a grand tournament here, just after the conquest of Wales. The town consists of a few straggling houses: it has a small port, but little or no commerce. The church is a plain building: and there are, as in most Welsh towns, several dissenting meeting-houses. The population of the whole parish in 1831 was 1726. The market is on Saturday, and there are four annual fairs. The living is a vicarage in the gift of the bishop of Bangor.

This borough is contributory to Caernarvon. The little harbour of Porth yr Lleyn near Nevin is supposed to have been used by the Romans, as strong entrenchments, apparently their work, may be observed in the neighbourhood.

Crickeith or Criccieth lies on the bay of Cardigan. This is a poor straggling place, with houses built without any regard to order, and having nothing worthy of notice save the ruins of the antient castle. This is probably of Welsh origin, though ascribed by some to Edward I, who caused some repairs and alterations to be made, to render it more secure. The castle stands on an eminence jutting into the sea, and, though never very large, was probably of some importance from its position. The population of Criccieth in 1831 was 648. Criccieth is a contributory borough to Caernarvon. There is a free school.

Tremadoc, a place of quite modern date, is on the road from London to Crickeith and Pwllheli. It stands upon a portion of the Traeth Mawr, a sandy wash at the mouth of the river Glas Llyn, recovered from the sea by the enterprise of W. A Madocks, Esq., who built the town, to which he gave his name, Tre-Madoc (*tre*, a house, home, township, or village). Mr. M. laid out the town in the form of an oblong square, having a market-house on the E side, a handsome building, with the upper story laid out in good assembly-rooms. On the other sides of the area are well-built houses: a church in the pointed style, a place of worship for dissenters, a bank, and a good inn are to be found here. There is a market on Friday.

There are good quays at Port Madoc, about a mile from the town, to which vessels of 300 tons can come up. Slates and copper ore are exported.

Divisions for Ecclesiastical and Legal Purposes.—The number of parishes given in the population returns is 68, and there are 5 parishes which are partly in this and partly in the adjoining counties, Denbigh or Merioneth. Of these 68 parishes 14 are dependent chapelries, 2 are not noticed in our authority (*The Clerical Guide*), and of 2, by some oversight, we have no account. Of the remaining 50, 24 are rectories, 9 vicarages, and 17 perpetual curacies; to which we may add 1 dependent chapelry and 1 perpetual curacy, not noticed in the population returns. Nearly all the county is in the diocese and archdeaconry of Bangor, some few parishes are in the archdeaconry of Merioneth, and one in that of Anglesey in the same diocese. Three parishes E. of the Conwy are in the diocese of St. Asaph.

Caernarvonshire is in the North Wales circuit. The assizes and sessions are held at Caernarvon. The county returns one member. Caernarvon is the chief place of county election; the polling places are Caernarvon, Conwy, Capel Curig, and Pwllheli. The borough of Caernarvon, with its contributory boroughs of Conway, Criccieth, Nevin, and Pwllheli, and the city of Bangor (this last added by the Reform Act), returns one member.

History and Antiquities.—There is some difficulty in determining by what tribe of native Britons Caernarvonshire was peopled at the Roman conquest. The neighbouring districts of North Wales were peopled by the Ordovices, and we incline to comprehend Caernarvonshire in the territory of that tribe. Many persons, induced probably by the circumstance that Ptolemy gives to the headland of Braich-y-Pwll the name of the promontory of the Cancani, Καγκανῶν ἄκρον* (or, according to one MS., Γαγγανῶν), have assigned this county to the Cangi. If, however, this be the tribe against which Ostorius marched in the early part of his command in Britain [BRITANNIA], its situation could hardly be so far W. We therefore cannot agree with those who place the Cangi hereabout. Ptolemy does not mention any such people, and it may be questioned whether Καγκανῶν is the genitive case. That geographer mentions the Conway under the name of Toisobius. The Romans crossed this county under Suetonius Paulinus when they attacked Mona (Anglesey), about A.D. 59. The Ordovices were not, however, subdued until the time of Agricola, who nearly extirpated them about A.D. 78. In the Itinerary of Antoninus two stations within this county are given: Segontium, now Caer Seiont [CAERNARVON]; and Conovium, now Caer-Rhun, near Conwy, where Roman bricks have been found inscribed LEG. X, and the foundations of buildings discovered. The name of this station, Conovium, is evidently connected with that of the river; the latter is called in the map of Richard of Cirencester, Conovius.

In the division of the territories of Rhodri Mawr, or Roderick the Great, between his sons (A.D. 877), Caernarvonshire formed part of the kingdom of Gwynedd (Latin Venedocia) or North Wales, allotted to Anarawd. When the cessation of the northern piracies allowed the English kings (now of the Norman race) to turn their arms against Wales, this county, from its remote situation, difficult access, and mountainous character, became the last asylum of the independence of Wales. It was, however, with the rest of North Wales, completely subdued by Edward I., A.D. 1283. In the subsequent revolt of the Welsh under Madoc, the illegitimate son of Llewelyn, prince of Wales, Caernarvon was taken, and the English settlers massacred. Conwy Castle was besieged, but without effect.

Dolbadern Castle is on a rocky eminence near the junction of the two lakes of Llanberris. It is not ascertained at what time or by whom it was erected, but it is supposed to be of British origin. The foundations of Diganwy Castle, near Great Orme's Head, may be traced. Penrhyn Castle, near Bangor, is of the time of Henry VI., and, up to the period of the alterations made some years since, presented a fair specimen of the domestic architecture of that time.

Caernarvonshire has very few monastic ruins. There was a priory of Black or Austin Canons at Beddgelert, supposed to be the oldest religious foundation in Wales except Bardsey, but there are no remains of it. It was enriched by an endowment of Llewelyn ap Jorwerth, prince of North Wales, who reigned at the end of the twelfth century. At the dissolution its yearly revenue was 70*l.* 3*s.* 8*d.* according to Dugdale, or 69*l.* 3*s.* 8*d.* according to Speed.

Statistics.—Population. Caernarvonshire is mostly an agricultural county. Of 16,709 males 20 years of age and upwards, in 1831, there were occupied in agriculture 8103. Only 143 were engaged in manufactures or in making manufacturing machinery; of these 143 more than 100 were employed in weaving woollen goods. The following summary of the population as it existed in May, 1831, shows the number of inhabitants and their occupations in each hundred, &c. of the county :—

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not included in the two preceding classes.	Males.	Females.	Total of persons.	
Commitmaen . .	991	1,003	—	15	745	119	139	2,409	2,639	5,048	1,186
Crenddyn . . .	526	528	—	13	334	58	136	1,365	1,355	2,720	677
Dinntaen . . .	1,499	1,562	22	36	931	262	369	3,616	3,863	7,479	1,794
Evivnydd . . .	1,405	1,478	2	35	828	312	338	3,559	3,658	7,217	1,797
Gafflogian . . .	880	947	15	22	350	401	196	2,149	2,352	4,501	1,104
Isaf	811	909	10	33	446	236	227	1,969	2,141	4,110	1,079
Is-Gorfai . . .	2,482	2,778	30	106	444	434	1,900	6,181	6,663	12,844	3,151
Nant-Conway . .	672	688	1	28	376	69	243	1,572	1,733	3,305	769
Uchaf	1,309	1,380	7	21	393	183	804	3,850	3,474	7,324	1,961
Uwch-Gorfai . .	1,475	1,490	14	66	720	152	618	3,515	3,634	7,149	1,815
Bangor (city) . .	1,171	1,790	18	59	211	771	808	1,983	2,768	4,751	1,346
Totals .	13,221	14,553	119	434	5,778	2,997	5,778	32,168	34,280	66,448	16,709

The population of Caernarvonshire at each time the census has been taken in this century was :—

		Females.	Total.	Inc. per cent.
1801			41,521	
1811			49,336	18·82
1821	28,412	29,546	57,958	17·48
1831	32,168	34,280	66,448	13·44

Showing an increase between the first and last enumerations of 24,927 persons, or about 60 per cent., which is somewhat above the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor, at the three periods of

		£		s.	d.	
1811	were	12,493	being an average of	5	0	for each inhabitant.
1821	,,	16,226	,,	5	7	
1831	,,	21,205	,,	6	5	

The expenses for the same purpose in the year ending 25th March, 1834, was 20,136*l.* 3*s.*; and assuming that the population has increased since 1831 in the same uniform ratio as the average of the ten preceding years, the above sum affords an average of 5*s.* 10*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in this county for poor's rate, county rate, and other local purposes, in the year ending 25th March, 1833, was 25,720*l.* 7*s.* In the same year there was expended —

	£	s.
For the relief of the poor . .	21,319	14
In suits of law, removal of paupers, &c.	1,240	0
For other purposes	3,399	0
	£ 25,958	14

The descriptions of property assessed for local purposes are not distinguished in the returns made up for the year ending March, 1834. The total amount levied in that year was 25,555*l.* 4*s.*, and the expenditure was as follows :—

	£	s.
For the relief of the poor . . .	£20,136	3
In suits of law, removal of paupers, &c.	1,367	2
For other purposes . . .	3,469	16
	£24,973	1

The difference of expenditure in the two years has therefore been rather more than 6 per cent. in favour of 1834 in money spent for relieving the poor; but the other expenses have increased, and the saving on the whole amount is not quite 3½ per cent.

The number of turnpikes trusts in Caernarvonshire in 1829 was 3: the length of roads under their charge 129 miles; the annual income from the tolls and parish composition was 1453*l.*, and the annual expenditure 1110*l.*

The county expenditure for various purposes, exclusive of the relief of the poor, was 1911*l.* 18*s.* 8*d.* in 1833.

The sum levied for county rate in 1833 was 2574*l.* 11*s.* 9½*d.*

The number of persons charged with criminal offences in Caernarvonshire in the three septennial periods ending with 1820, 1827, and 1834, were 64, 120, and 152 respectively, being an average of 9 annually in the first period, of 17 in the second, and of 22 in the last period.

The number of persons tried at quarter sessions in each of the years 1831, 1832, and 1833, was 19, 7, and 7: of these there were committed for—

	1831.	1832.	183
Felonies . .	17	6	5
Misdemeanors .	2	1	2
The number convicted was	14	6	6
,, acquitted	3	1	1

At the assizes and sessions in 1835, 30 persons were charged with crimes; of these 4 were offences against the person, 1 offence against property committed with violence, and 21 offences against property committed without violence: of the latter number 15 were simple larceny; the remaining 4 offenders were committed, 2 for forgery and 2 for riot. Two only out of the number of persons accused were females.

Of the above 10 could read and write, 2 could read only, and 13 could neither read nor write: the degree of instruction of the remaining 5 was not ascertained. The proportion of the offenders to the population in 1835 was 1 in 2215.

Caernarvonshire has two savings-banks; the number of depositors and amount of deposits on the 20th of November, 1832, 1833, and 1834 respectively were :—

	1832.	1833.	1831.
Number of depositors .	817	786	826
Amount of deposits .	£24,709	23,643	24,549

Education.—The following abstract of the state of education in Caernarvonshire is taken from returns laid before the House of Commons in the sessions of 1835 :—

	Schools.	Scholars.	Total.
Infant Schools	2		
Number of infants at such schools, ages from 18 months to 7 years:—			
Males		75	
Females . . .		100	
Sex not specified		—	
			175
Daily Schools	74		
Number of children at such Schools, ages from 4 to 14 years :—			
Males		1594	
Females . . .		1244	
Sex not specified		753	
			3591
Total of children under daily instruction			3766
Sunday Schools	213		
Number of children and others at such Schools, ages from 4 to 18 years :—			
Males		8603	
Females		7222	
Sex not specified		8598	
			24,223

Among the children many attend both the Sunday and Day Schools, and they are therefore twice enumerated in the abstract.

Maintenance of Schools.

Description of Schools	By endowment		By subscription.		fro		Subscrip. and payment from scholars	
	Schls.	Scholars.	Schls	Scholars	Schls	Scholars	Schls.	Scholars.
Infant Schools	1	35	—	—	—	—	1	140
Daily Schools	14	672	3	209	41	1766	16	944
Sunday School	3	274	207	23,729	—	—	3	220
	18	981	210	23,938	41	1766	20	1304

Schools established by Dissenters, included in the above:

	Schools.	Scholars.
Infant Schools	—	—
Daily Schools	9	287
Sunday Schools	164	20,393

Schools established since the year 1818:—

Infant and other daily schools	27 containing	1712 scholars.
Sunday Schools.	176 „	20,840 „

Lending libraries of books are attached to six schools in Caernarvonshire.

CAERPHILLY. [GLAMORGANSHIRE.]

CÆSALPINIA, a genus belonging to the tribe Cassieæ, of the natural order Leguminosæ, and especially distinguished by the lowermost of its sepals being arched, the uppermost of its stalked petals being the shortest, its stamens all perfect with shaggy bases, and the fruit a compressed bivalved pod. The species are trees or shrubs, found in both the East and West Indies, with showy yellow flowers, abruptly pinnated leaves, and stems which are usually more or less prickly. It is introduced here because the Brazil-wood of commerce is said to be furnished by two of its species.

One of these, *C. Brasiliensis*, is a West Indian rather than a Brazilian tree, without prickles, downy flower-stalks, panicled flowers, smooth obtuse oblong leaflets. The other, *C. echinata*, which is really a Brazilian plant, is a prickly tree, with yellow and red blossoms, smelling deliciously like lilies of the valley, prickly pods, and oval blunt leaflets. Both these species undoubtedly yield a red wood, but it is by no means clear that they exclusively furnish the Brazil-wood of commerce, as is commonly stated. According to Dr. Bancroft, this article is obtained from a tree with a large crooked knotty stem, the bark of which is so thick, that a tree as large as a man's body with the bark, will not be so thick as the leg when peeled; and he calls this species C. Brasiletto, a name unknown to botanists: he however states that it is called by the natives *Ibiripitanga*. Now that is the name given by Marcgraaf to the C. echinata, but this author says nothing about the peculiarity in the bark. One authority however ascribes a particularly thick alburnum to C. echinata, but says nothing of the bark. Malte Brun says there are three kinds of *mirim* or Brazil-wood found in Brazil; but he includes with them the C. Brasiliensis, which there is no good authority for considering a native of that country. Féo again refers the sappan wood of the East Indies (cæsalpinia sappan) to one of the Brazil-woods of the merchants. Upon the whole it appears that we have no good testimony as to what the tree is that yields it; but it is probable that it is the produce of many species, and possibly of more than one genus, for De Candolle and Sprengel doubt whether the cæsalpinia echinata is not rather a guilandina. It is much to be regretted that travellers generally bring home with them no precise information upon such points as these; but for this we have to thank the system of education in this country, under which natural history is altogether excluded from the studies of young men. The best Brazil-wood is said to come from Pernambuco, where it is called *pāo da rainha* or queen's wood, on account of its being a royal monopoly. (Macculloch's *Dict. Com.*, 182.)

CÆSAR (Καῖσαρ), the *cognomen* or distinctive family name of a branch of the illustrious Julian *gens* or house. Various etymologies of the name have been given by Roman writers, but they all seem unsatisfactory, and some of them ridiculous, except that which connects it with the word *cæsaries*, properly 'the hair of the head.' It was not unusual for the family names among the Romans to be derived from some personal peculiarity: examples of this are Naso, Fronto, Calvus, &c. The Julian gens was one of the oldest patrician houses of Rome, and the branch of it which bore the name of Cæsar deduced its origin from Iulus, the son of Æneas, and consequently claimed a descent from divine blood. (Sueton. *Cæsar.*) The Julian gens is traced back historically to A.U.C. 253, or B.C. 501, but the first person who bore the distinctive family name of Cæsar is probably Sextus Julius Cæsar, who was quæstor A.U.C. 532, and from whom Caius Julius Cæsar, the dictator, may be traced through five descents. (*Transactions of the Royal Society of Literature*, vol. i. pt. 2.)

In pursuance of the will of C. J. Cæsar, the dictator, Octavius, afterwards the Emperor Augustus, who was the grandson of the dictator's sister, Julia, took the family name of Cæsar. Tiberius Nero, who was adopted by his stepfather Augustus, also took the name of Cæsar. Caligula and Claudius, his successors, were descended from Julia, the dictator's sister; and in the person of Nero, the successor of Claudius, the family of Cæsar became extinct. Nero was removed five descents from Julia, the dictator's sister. [AUGUSTUS.]

When Hadrian adopted Ælius Verus, who was thus received into the imperial family, Verus took the name of Cæsar. Spartianus, in his life of Ælius Verus, remarks, 'Verus was the first who received the name of Cæsar only, and that not by will, as before, but pretty nearly in the same way as in our times (the reign of Diocletian) Maximianus and Constantius were named Cæsars, and thus designated as heirs to the empire.' Thus the term Augustus under the later emperors signified the reigning prince, and Cæsar or Cæsares denoted the individual or individuals marked out by the emperor's favour as being in the line of succession.

CÆSAR, CAIUS JULIUS, the son of C. J. Cæsar and Aurelia, was born B.C. 100, on the 12th of Quintilis, afterwards called Julius, from the name of the person of whom we are speaking. His aunt Julia was the wife of Caius Marius, who was seven times consul. In his seventeenth year he married Cornelia, the daughter of Cinna, by whom he had a daughter, Julia. This connexion with Marius and Cinna, the two great opponents of the dictator Sulla, exposed him to the resentment of the opposite faction. By Sulla's orders he was deprived of his wife's dowry and of the fortune which he had inherited by descent, stripped of his office of priest of Jupiter (Flamen Dialis), and compelled to seek safety by flight. (Plut. *Cæsar*, i.; Suetonius, *Cæsar.*) Sulla is said to have spared his life with great reluctance, observing to those who pleaded his cause, that the youth 'would be the ruin of the aristocratic party, for there were many Marii in Cæsar.'

He first served under M. Thermus in Asia, and distinguished himself at the capture of Mitylene (B.C. 80 or 79); but his reputation suffered by a report (possibly an unfounded one) of scandalous profligacy during a visit which he paid to Nicomedes, the king of Bithynia. In the following year he served under Servilius Isauricus in Cilicia. The news of Sulla's death soon brought him back to Rome, but he took no part in the movements of M. Æmilius Lepidus, who made a fruitless attempt to overthrow the aristocratical party, which had been firmly established during the tyranny of Sulla. It is not unlikely, as Suetonius observes, that he had no confidence in Lepidus, and that he had penetration enough to see that the time was not come for humbling the aristocracy of Rome. Whatever opinion may be entertained as to Cæsar having very early formed a design to seize on the sovereign power, it is at least certain that from his first appearance in public life he had a settled purpose to break the power of the aristocracy, from which he and his relatives had suffered so much. After his unsuccessful impeachment of Dolabella for mal-administration in his province, he retired to Rhodes, and for a time became a pupil of the rhetorician Molo, one of the greatest masters of the art, whose instruction Cicero had attended, probably a year or two before Cæsar's visit.

For some time Cæsar seems to have had little concern in public life, being kept in the background by the predominance of the aristocratical party and the successful career of Metellus, Lucullus, Crassus, and Pompey. About B.C. 69, being elected one of the military tribunes, he had sufficient influence to procure an enactment for the restoration of L. Cinna, his wife's brother, and of those partisans of Lepidus who after his death had joined Sertorius in Spain. (Suetonius.) The following year he was quæstor in Spain, and on his return to Rome, he was elected Ædile for B.C. 65. Just before entering on office he fell under some suspicion of being engaged in a conspiracy to kill the consuls Cotta and

Torquatus, and effect a revolution. Whether there really was a conspiracy or not may be doubted; Cæsar's share in it at least is not clearly established. The office of Ædile gave Cæsar an opportunity of indulging his taste for magnificence and display, by which at the same time he secured the favour of the people. He beautified the city with public buildings, and gave splendid exhibitions of wild beasts and gladiators. Cæsar, who was now five-and-thirty years of age, had enjoyed no opportunity of distinguishing himself in a military capacity; while the more fortunate Pompey, who was only six years older, was spreading his name and the terror of the Roman arms throughout the East. A favourable occasion seemed to present itself in Egypt. Alexander, the king who had been honoured with the name of friend and ally of the Roman people, was ejected from Alexandria by the citizens. The popular feeling at Rome was against the Alexandrians, and Cæsar thought he had interest enough through the tribunes and the democratical party to get appointed to an extraordinary command in Egypt. But the opposite faction was strongly united against him, and he failed in his attempt. The next year he was more successful. By a judicious application of money among the poorer voters, and of personal influence among all classes (Dion. xxxvii. 37), he obtained the Pontificatus Maximus, or wardenship of the ecclesiastical college of Pontifices, a place, no doubt, of considerable emolument, to which an official residence in the Sacra Via was also attached. (Sueton. *Cæsar*, 13. 46.) This union of civil and religious functions in the same person, at least in the higher and more profitable places, was a part of the old Roman polity, which, among other consequences, prevented the existence of a hierarchy with a distinct and opposing interest.

At the time of the important debate on the conspiracy of Catiline (B.C. 63), Cæsar was prætor designatus (prætor elect for the following year), and accordingly spoke in his place in the senate. He was the only person who ventured to oppose the proposition for putting the conspirators to death: he recommended their property to be confiscated, and that they should be dispersed through the different municipia of Italy, and kept under a strict surveillance. The speech which Sallust has put into his mouth on this occasion, if the substance of it be genuine, will help us to form some estimate of Cæsar's character and his policy at this period. The address is singularly well adapted to flatter the dominant party, and also to keep up his credit with those who were hostile to the aristocratic interests. His object was to save the lives of the conspirators, under the pretext of inflicting on them a punishment more severe than that of death. But for Cato he might probably have carried his motion. According to Suetonius, Cæsar persevered in his opposition till his life was actually threatened by the armed Roman Equites, who were introduced into the senate-house under the pretext of protecting the senate during their deliberations. (Compare Plut. *Cæsar*. viii.) Cicero, who was then consul, and in the height of his prosperity and arrogance, might, it is said, by a single nod, have destroyed this formidable opponent of the order of which he had become the devoted champion; but either his courage failed him, or some motive perhaps more worthy, led him to check the fury of the Equites. In the following year, during his prætorship, the opposite faction in the senate, who were bent on crushing Cæsar's rising influence, actually passed a decree (decretum) by which Q. Cæcilius Metellus Nepos, one of the tribunes of the plebs, and Cæsar, who strongly supported him in his measures, were declared incapable of continuing in the exercise of their official duties. Cæsar still discharged the judicial functions of his magistracy, till he found that force would be used to compel his submission to this illegal and impolitic act of the senate. The populace were roused by this strange proceeding, and Cæsar apparently might have had their best assistance against his enemies; but prudence for the present induced him to check the zeal of his partizans, and the senate, apparently alarmed by this demonstration, repealed their own decree, and thanked him for his conduct.

An affair which happened during Cæsar's prætorship caused no little scandal at Rome. While the ceremonies in honour of the Bona Dea were performing in the house of Cæsar, [illegible] which women only could be present, the profligate Clodius, putting on a woman's dress, contrived to get admission to these mysterious rites. On the affair being discovered Cæsar divorced his wife Pompeia, whom he had married after the death of Cornelia; and Clodius, after being brought to a public trial on a charge of impiety, only escaped by bribing the judices or jury. (Cic. *Ep. ad Att.* i. 12, &c.; Dion. xxxviii. 45.) From motives of policy Cæsar did not break with Clodius: he probably feared his influence, and already saw that he could make him a useful tool, and a bugbear to Cicero.

The year 60 B.C. was spent by Cæsar in his province of Hispania Ulterior or Southern Spain, where he speedily restored order and hurried back to Rome before his successor came, to canvass for the consulship. The aristocratical party saw that it was impossible to prevent Cæsar's election; their only chance was to give him a colleague who should be a check upon him. Their choice of Bibulus seems to have been singularly unfortunate. Bibulus was elected with Cæsar in opposition to Lucceius, with whom Cæsar had formed a coalition, on the condition that Lucceius should find the money, and that Cæsar should give him the benefit of his influence and recommendation. The scheme of Cæsar's enemies proved a complete failure. Bibulus, after unavailing efforts to resist the impetuosity of his colleague, shut himself up in his house, and Cæsar, in fact, became sole consul. (Dion. xxxviii. 8.) In order to stop all public business, Bibulus declared the auguries unfavourable; and when this would not answer, he declared that they would be unfavourable all through the year. This illegal conduct only tended to justify the violent measures of his colleague. The affair, though a serious one for the hitherto dominant faction, furnished matter for the small wits of the day, who used to sign their notes and letters in the 'Consulship of Julius and Cæsar,' instead of naming both consuls in the usual way.

Cæsar had contrived, by a masterly stroke of policy, to render ineffectual all opposition on the part of his opponents. Pompey was dissatisfied because the senate delayed about confirming all his measures in the Mithridatic war and during his command in Asia; Crassus, who was the richest man in the state, and second only to Pompey in influence with the senatorial faction, was not on good terms with Pompey. If Cæsar gained over only one of these rivals, he made the other his enemy; he determined therefore to secure them both. He began by courting Pompey, and succeeded in bringing about a reconciliation between him and Crassus. It was agreed that there should be a general understanding among the three as to the course of policy; that all Pompey's measures should be confirmed, and that Cæsar should have the consulship. To cement their alliance more closely, Cæsar gave Pompey his daughter Julia in marriage, though she had been promised to M. Brutus. (Plut. *Pomp.* 47.) Cæsar also took a new wife on the occasion, Calpurnia, the daughter of Piso, whom he nominated one of the consuls for the ensuing year. This union of Pompey, Crassus, and Cæsar is often called by modern writers the first triumvirate. The effect of it was to destroy the credit of Pompey, throw disunion among the aristocrats, and put the whole power of the state in the hands of one vigorous and clear-sighted man. (As to the affair of Vettius [Dion. xxxviii. 9.], see CICERO.)

It is unnecessary to detail minutely the acts of Cæsar's consulship, which rather belong to a history of Rome. From the letters of Cicero, which are contemporary evidence, we perceive that the Senate at last found they had got a master whom it was useless to resist; Cato alone held out, but he stood by himself. One of the most important measures of Cæsar's consulship was an Agrarian law for the division of some public lands in Campania among the poorer citizens [for the nature of these laws, see AGRARIAN LAW], which was carried by intimidation. Pompey and Crassus, who had given into all Cæsar's measures, accepted a place in the commission for dividing these lands. Clodius, the enemy of Cicero, was, through Cæsar's influence, and the help of Pompey, adopted into a plebeian family, and thus made capable of holding the office of tribune; an event which Cicero had long dreaded, and fondly flattered himself that he should prevent by a temporising policy. Clodius, the next year, was elected a tribune, and drove Cicero into exile. (Dion. xxxviii. 12, &c.)

The Roman consuls, on going out of office, received the government of a province for one year. Cæsar's opponents unwisely made another and a last effort against him, which only resulted in putting them in a still more humiliating position: they proposed to give him the superintendence of the roads and forests. Vatinius, one of his creatures, forthwith procured a law to be passed, by which he obtained for Cæsar the province of Gallia Cisalpina, or North Italy, and Illyricum, for five years; and the Senate, fearing the p[illegible] might grant still more, not only confirmed the measure, [illegible] making a merit of necessity, added the province of Gallia Transalpina. 'From this moment,' remarks a lively modern writer (Schlosser, *Universal. Histor. Uebersicht*), 'the history of Rome presents a striking parallel to the condition of the French republic during Bonaparte's first campaign in Italy. In both cases we see a weak republican administration in the capital involved in continual broils, which the rival factions are more interested in fostering, than in securing the tranquillity and peace of the empire. In both cases we find a province of the distracted republic occupied by a general with unlimited power—the uncontrolled master of a territory which, in extent and importance, is equal to a mighty kingdom—a man of superior understanding, desperate resolves, and, if circumstances rendered it necessary, of fearful cruelty—a man who, under the show of democratical opinions, behaved like a despot, governed a province at his pleasure, and established an absolute control over his soldiers by leading them to victory, bloodshed, and pillage.'

The Gallic provinces at this time subject to Rome were: Gallia citerior, or Cisalpine Gaul (North Italy); and Gallia ulterior, or the southern part of Transalpine Gaul, also called emphatically 'Provincia,' (whence the modern Provence,) whose capital was Narbo, now Narbonne. The Provincia extended from the Mediterranean to the Cebenna mountains, and included the modern provinces of E. Languedoc, Provence and Dauphiné. On the N. it joined the Allobroges, then lately subjected to Rome. When Cæsar, in his Commentaries, speaks of Gaul, which he divides into Aquitania, Celtica and Belgica, he means the Gaul which was then independent, and which he conquered, exclusive of the Provincia already subject to Rome.

In March 58 B.C., while Cæsar was still at Rome, news came that the Helvetians, united with several German tribes, were leaving their country with their wives and children in order to settle in S. Gaul, and were directing their march upon Geneva to cross the Rhone at that place. Cæsar hastened to Geneva, cut the bridge, and raised a wall or entrenchment between the Rhone and the Jura in order to close the passage against the Helvetians. The Helvetians asked permission to pass through the Roman province on their way to the country of the Santones (Saintonge), as they said, and on Cæsar's refusal they resolved to cross the Jura higher up into the country of the Sequani (Franche Comté), with whom they entered into negotiations to that effect. Cæsar, foreseeing danger to the Roman province if the Helvetians succeeded in settling themselves in Gaul, resolved to prevent them at all risks. He left his lieutenant Labienus at Geneva, with the only legion he had in the province, and hastened back to Cisalpine Gaul, where he raised two fresh legions, and summoned three more which had wintered near Aquileia. With these five legions (about 30,000 men) he took the most direct road to Gallia ulterior, crossing the Alps by Ocelum (Exilles, between Susa and Briançon), and marched through the province to the country of the Segusiani, the nearest independent Gaulish people, who lived near the confluence of the Rhone and the Arar (the Saone). The Helvetians meantime having crossed the country of the Sequani had reached the Arar, which divided the Sequani from the Ædui, a considerable nation of Celtic Gaul, who extended from the Arar to the Ligeris, and who were friendly with Rome. The Ædui applied to Cæsar for assistance. He watched the motions of the Helvetians, and having learnt that three-fourths of their number had crossed the Arar, he marched at midnight with three legions, and fell upon those who still remained on the E. bank with the baggage, and killed or dispersed them. These were the Tigurini who, about 50 years before, having joined the Cimbri, had defeated and killed the Roman consul L. Cassius. Cæsar crossed the Arar in pursuit of the Helvetian main body. After a useless conference between Cæsar and old Divico the Helvetian leader, the Helvetians continued to advance into the country of the Ædui, and Cæsar after them. Cæsar's cavalry, 4000 strong, composed of Gaulish horsemen raised in the Provincia and among the Ædui, had the worst in an engagement against 500 Helvetian horsemen. Cæsar discovered that there was a party hostile to Rome among the Ædui, at the head of which was Dumnorix, a young man of great wealth, influence, and ambition, who secretly favoured the Helvetians, although he actually commanded a body of the auxiliary cavalry under Cæsar. At the same time the provisions which the Ædui had promised to supply to the Roman army were not forthcoming. Cæsar sent for Divitiacus, the brother of Dumnorix, a [illegible], who was friendly to Rome, and told him all he knew about his brother's double dealing. Divitiacus acknowledged his brother's fault, and obtained his pardon. We find afterwards (*De Bello Gallico*, V. 7.) that Dumnorix continued in his heart hostile to the Romans, and at the time of Cæsar's first expedition into Britain refused to embark with his auxiliaries, left Cæsar's camp, was followed, overtaken, and put to death.

The movements of the Helvetians through the country of the Ædui must have been very slow and circuitous, for we find that Cæsar, after following them for a fortnight, was about 18 miles from Bibracte (Autun), which is not above 80 miles from the most distant point of the Arar where they could have crossed. Cæsar, who had now only two days' provisions left, gave up the pursuit, and took the road to Bibracte the principal town of the Ædui. The Helvetians, mistaking this movement for a retreat, turned round and followed the Romans. Cæsar halted on a hill, formed his four old legions in three lines half-way up the hill, and placed in their rear higher up the two new legions, as well as the auxiliaries. The baggage he assembled and entrenched on the summit of the hill. The Helvetians, whom Cæsar on this occasion calls Gauls, for they were in fact a Celtic race, having left all their baggage, waggons, and families in one spot, closed their ranks and formed their phalanx, repulsed Cæsar's cavalry, and advanced to attack his first line. Numbers were vastly in their favour. Cæsar, having dismounted, sent away his own and all the other horses, to preclude all hope of flight, and having harangued his men gave the signal for battle. The legionaries, from their elevated position, threw their javelins with great force upon the advancing Helvetians, and having disordered their phalanx, rushed sword in hand upon them. Owing to the close order of the Helvetian ranks it happened that, in many instances, the Roman javelins transfixed two shields at once, so that the bearers being unable to extricate one from the other, were obliged to throw their shields away and fight unprotected. At last, covered with wounds, the Helvetians retired towards a mountain a mile distant. The Romans followed them, but were attacked in flank by the Boii and Tulingi, 15,000 strong, who formed the Helvetian rear-guard. Cæsar ordered his third line to face about and repel these new enemies, while the other two were engaged against the Helvetian main body who had halted and returned to the charge. This double fight lasted from noon till sunset, during which time none of the Helvetians were seen to turn their backs. They withdrew at last, one part to the mountain and the rest to their baggage, where they continued to fight desperately behind their carts during the night, till they were nearly all killed. The other part, to the number of 130,000 individuals, moved off during the night, and marching in a north direction arrived in the country of the Lingones (Langres): the Romans were unable to follow them, being detained three days on the field of battle in attending to their wounded and burying their dead.

In the Helvetian camp were found written tablets containing the muster of the different tribes which composed the emigration, to the number of 368,000 individuals, of whom 92,000 were fighting men. Cæsar says the tablets were written in Greek characters: it has been supposed by some that they were Etruscan letters somewhat resembling the old Greek, and perhaps introduced into Helvetia by the Rhæti or Rasena, an Etruscan people.

After three days, Cæsar marched in pursuit of the Helvetians, who threw themselves on his mercy. Cæsar demanded their arms, hostages, and the surrender of the slaves and other fugitives who had taken refuge among them; and they were ordered to return home, and cultivate their lands. The Boii alone, distinguished for their bravery, were allowed to remain among the Ædui at the request of the latter. A part of one of the Helvetian tribes, pagus Verbigenus, 6000 in number, having marched off in the midst of the confusion and darkness of the night, and taken the way towards the Rhine and Germany, were pursued by Cæsar's order, brought back and 'treated as enemies,' which then meant that they were either [illegible] death or sold as slaves. The Helvetians, who returned home, were mustered by Cæsar, and found to be 110,000 individuals, men, women, and children.

Cæsar says that his principal object in sending the Helvetians back was to prevent the Germans beyond the Rhine from occupying their country and becoming formidable neighbours to the Roman provinces. The report of Cæsar's victory spread rapidly through all Celtic Gaul, the various tribes of which began to look up to him as their arbiter in their internal differences. The Ædui complained to him that Ariovistus, a powerful king of the Germans, being invited by the Sequani and the Arverni, between whom and the Ædui there was an old rivalry, had crossed the Rhine some time before with 15,000 men, who had afterwards increased to 120,000, had defeated the Ædui and their allies in a great battle, had occupied several provinces of Gaul, exacted hostages of them, and was in fact oppressing the country. The Gauls described the Germans as an athletic, fierce, and formidable people. Cæsar, who, during his consulship in the previous year, had induced the senate to acknowledge Ariovistus as a king and friend of Rome, now sent to him requesting an interview which the German declined. Cæsar then required him by message to desist from bringing over the Rhine fresh bodies of Germans, and from molesting the Ædui and their allies, who were neighbours to the Roman Province, and to restore their hostages. Ariovistus replied that as he had never dictated to the Romans what use they should make of their victories, he would not be dictated to by them; that the Ædui were his tributaries by force of arms. Cæsar, learning that other Germans, and particularly the Suevi, a powerful nation, were approaching the Rhine to join Ariovistus, determined on attacking him. He occupied Vesontio (Besançon), a strong town of the Sequani, before Ariovistus could seize it. The fearful reports of the Gauls about the Germans spread alarm in Cæsar's camp, especially among the young officers, military tribunes, præfects, and others, accustomed to the luxuries of Rome, and who had followed Cæsar out of personal friendship (I. 39). Skulking in their tents, they lamented their fate, and were busy making their last wills. The panic spread to the veterans, and Cæsar was told that it would be impossible to advance farther; that the roads were impracticable; that no provisions could be collected, and, in short, that the soldiers would not follow him if he raised his camp. Having assembled the officers, he told them that it was not their business to discuss the measures and orders of their general, ridiculed their fears of the Germans, since the Cimbri and Teutones, the most formidable of that race, had been defeated by the Roman arms, and signified to them that he would raise the camp next morning, and if they refused to follow him, would march forth with the tenth legion alone. This was Cæsar's favourite legion. This harangue had its full effect, and Cæsar marched from Vesontio to meet Ariovistus. After a fruitless interview between the two chiefs, which is graphically described by Cæsar, Ariovistus arrested and put in chains Valerius Procillus, Cæsar's friend and confidential interpreter, and Mettius, who had gone to the German camp to renew the negotiations. Cæsar prepared for battle, but Ariovistus remained in his camp for several days, because, as Cæsar was informed by the prisoners, the German matrons had declared that their countrymen would be losers if they fought before the new moon. Accordingly the Roman general determined to make the attack. The Germans came out, and formed for battle in phalanxes by order of nations, the Harudes, Marcomanni, the Tribocci, the Vangiones, the Nemetes, the Sedusii, and the Suevi; and they placed their waggons, baggage, and women in a semicircle behind them so as to prevent escape. The signal being given, both armies rushed to the encounter with such rapidity that the Romans had not time to throw their javelins, and at once resorted to their swords. Cæsar, perceiving that the left of the enemy was the weakest, commenced the attack on that point; many of his soldiers went up, and, grasping the enemies' shields, tried to snatch them away. Meantime the German right was pressing hard upon the Romans, who were much inferior in numbers, when young Crassus (the son of Licinius), who commanded the cavalry, moved the third or rear line obliquely to the support of the left, and thus recovered the advantage. The Germans gave way, and fled towards the Rhine, which was 50 miles distance, being pursued by Cæsar's cavalry. Many fell, some swam across the river, others, and Ariovistus among the rest, passed it in boats. Ariovistus's two wives and one daughter were killed in the flight; another daughter was taken. Valerius Procillus and Mettius were both rescued, to the great satisfaction of Cæsar.

Cæsar, having thus terminated the campaign, put his troops in winter-quarters among the Sequani, and himself crossed the Alps to Citerior or Cisalpine Gaul, to hold the usual courts for the administration of justice and the civil business of the province.

The campaign of 57 B.C. was against the Belgic Gauls, a powerful race of German origin, who had been long settled in the country between the Rhine and the Sequana (Seine). Alarmed by the advance of the Romans through Celtic Gaul, the Belgæ had, during the winter, formed a confederacy, and prepared themselves for resistance. Cæsar, with the usual logic of conquerors, found in these preparations a pretext for attack. He raised two more legions in Cisalpine Gaul, and proceeded at the beginning of summer to his camp in the Sequani. He then advanced with eight legions, and in fifteen days reached the country of the Remi, the first Belgic people on that side. The Remi made their submission, and gave him every information concerning the extent and the strength of the confederacy, which amounted, they said, to 300,000 fighting men. After crossing the river Axona (Aisne), Cæsar fixed his camp on the right or farthest bank, and fortified it with a rampart 12 feet high and a ditch 18 feet deep. The Belgæ meantime besieged the town of Bibrax (Bièvre?), belonging to the Remi, 8 miles from the Roman camp. Cæsar sent to its relief his light troops, namely, his Numidians, the Cretan archers, and the Balearic slingers. The Belgæ, raising the siege, advanced towards Cæsar's camp, and made some demonstrations, but Cæsar kept quiet in his entrenchments, and the Belgæ broke up for want of provisions, and resolved to fight each in his own territory. After subjecting the Suessiones, the Bellovaci, and the Ambiani, Cæsar marched against the Nervii, the most powerful of the Belgic nations. A desperate battle was fought on the banks of the Sabis (Sambre?), in which the Nervii actually surprised the Roman soldiers while in the act of tracing and entrenching their camp, and before they had time to form or put on their helmets. Cæsar's cavalry, auxiliaries, servants, drivers, and followers of the camp all ran away, spreading the report of the defeat of the Romans. Cæsar hurried from legion to legion, encouraging the men, and finally succeeded in re-establishing order. The tenth legion came to turn the scale. The Nervii fought desperately to the last, and their nation and name, says Cæsar, were nearly extinguished on that day. It was reported that out of 60,000 fighting men only 500 remained. The women and children sued for mercy, and Cæsar restored to them their territory and towns. The Aduatici were the descendants of a body of Cimbri and Teutones, who had settled towards the confluence of the Sabis and the Mosa. While on their march to support the Nervii, they heard of the total defeat of their allies, upon which they retired to a strong natural hold, where they were regularly besieged by Cæsar, who formed a line of circumvallation. When they saw the moveable towers and the battering ram approaching their walls, engines of which the Gauls had no idea, they sued for peace. Cæsar required them to throw their arms outside of their ramparts. They did so, but concealed one-third of them; they then opened their gates and mixed with the Roman soldiers. On the evening Cæsar withdrew his men within his lines, but at midnight the Aduatici came out in arms and attempted to scale Cæsar's entrenchments. Being repulsed with great loss, their place was entered the next day, and the people were sold as slaves to the number of 53,000.

Crassus, being detached by Cæsar across the Sequana into Western Gaul, received the submission of the Aulerci, Unelli, and Veneti, and other maritime people on the coasts of the ocean; and as the season was growing late, the army went into winter-quarters in the country of the Carnutes (about Orléans), Turones (Tours), and other parts of central Gaul. Cæsar set off, according to his custom, for Cisalpine Gaul, where his friends flocked from Rome to congratulate him on his successes. The senate, on receiving from the victorious general the usual official letters, ordered fifteen days of public thanksgiving to the gods, a period never granted before for any other general.

Cæsar's third campaign, 56 B.C., was against the Western Gauls. Crassus, while wintering with one legion among the Andes (Anjou), sent tribunes and other officers to the Veneti (Vannes in Brittany) and other people on the Atlantic coast to ask for provisions. The Veneti, a powerful commercial sea-faring people who had numerous ships in which they traded with Britain and other countries, having recovered from the alarm of Cæsar's conquests, arrested the officers of Crassus, and refused to give them up until their own hostages were restored. All the neighbouring maritime tribes made common cause with the Veneti. Cæsar immediately ordered galleys to be constructed on the Ligeris (Loire), and sent also to collect ships on the coast of the Pictones and Santones (Poitou and Saintonge), who were friends with Rome. He directed the fleet to attack the Veneti by sea, while he marched against them by land. He exclaimed loudly against the breach of treaties, and the arrest of the Roman officers after the Veneti had made submission and given hostages, while he acknowledges in his 'Commentaries' that he was afraid other nations would follow the example—'Knowing that it is the nature of all men to love liberty and hate servitude.' This was a critical time for the Roman general, but his presence of mind never forsook him in difficulties. He sent Labienus towards the Rhine to watch the Belgians and Germans, Crassus into Aquitania, gave the command of the fleet to Decimus Brutus, and himself marching against the Veneti, took several of their towns on the coast. But he soon found that by means of their ships they easily moved from one point to another, and that the only way to conquer them effectually was by sea. The description of the ships of the Veneti, their naval tactics, their habits and mode of life, is one of Cæsar's most interesting sketches. [BRETAGNE.] A great naval battle, which lasted all day, ended with the destruction of the fleet of the Veneti, to the number of above 200 ships. Cæsar, determining to strike terror into the neighbouring people, put to death all the senators or chief men of the Veneti, and sold the rest as slaves. The Unelli (in the neighbourhood of Cherbourg) were likewise conquered by Titurius Sabinus: and Crassus defeated the Aquitanians, though with considerable difficulty, and received hostages from various tribes of that remote region. Cæsar himself marched against the Morini and Menapii (Boulogne, Calais, &c., and further to the N. and E.), but the rainy season setting in, the soldiers could no longer remain under tents; and accordingly, after ravaging the country, he placed his troops for the winter among the Aulerci, Lexovii, &c. (Normandy). It would appear by the following book, iv. 6, that he went as usual to pass the winter in North Italy. (Compare also v. 53.)

The following year, 55 B.C., Pompeius and Crassus being consuls, two German tribes, the Usipetes and the Tenchteri, being harassed by the Suevi, crossed the Rhine near its mouth into the country of the Menapii, between the Mosa and the Scaldis (Scheldt). Cæsar gives an interesting account of the Suevi, the principal German nation with which the Romans were then acquainted. Being resolved to check any disposition on the part of the Germans to cross the Rhine, he set off for the army earlier than usual. He found, as he suspected, that several Gaulish nations had an understanding with the Germans. The Usipetes sent to ask permission to settle in Gaul. Cæsar answered that there was no vacant place in Gaul for fresh emigrants, but that if they chose to settle among the Ubii on the banks of the Rhine, who were themselves at war with the Suevi, he would employ his good offices for the purpose. While negotiations were going forward, Cæsar's Gaulish cavalry, 5000 strong, was suddenly attacked near the banks of the Mosa by 800 German horsemen, and, as usual, routed. The next day a number of German chiefs and elders came to Cæsar's camp to apologize for the affray. Cæsar arrested them all, and immediately marched against their camp, which being thus surprised and unprepared was easily entered, when the Romans made a dreadful carnage of the Germans. The survivors fled as far as the confluence of the Mosa and the Rhine, where most of them perished. This was the action about which Cato exclaimed so loudly against Cæsar in the Roman senate.

The Ubii being annoyed by the Suevi appealed to Cæsar, and offered him boats to cross the Rhine. Declining this offer, he constructed a bridge by means of piles driven in the bed of the river. He gives a minute description of the process of building the bridge (iv. 17). The bridge was finished in ten days, when Cæsar marched across, ravaged the country of the Sicambri, and re-assured the Ubii by his presence. Hearing that the Suevi had assembled all their forces in the interior of their country, and considering 'he had done all that the honour and interest of Rome required,' he re-crossed the Rhine after spending 18 days on German ground

He next made his first expedition into Britain (for which see BRITANNIA). On his return he chastized the Morini, who had attacked some of his detachments, put his troops into winter-quarters in Belgic Gaul, and then repaired to Cisalpine Gaul, as usual. In this year Cæsar's period of government was extended for five years more by a Senatus Consultum.

The next year, 54 B.C., Cæsar, after making an excursion into Illyricum, which formed also part of his government, returned into Gaul, where he had ordered a fleet to assemble at Portus Itius (between Boulogne and Calais) for a second attempt upon Britain. Meantime he visited the Treviri, the most powerful nation in cavalry of all Gaul. A dispute had arisen between Induciomarus and Cingetorix about the supreme authority; Cæsar, knowing Cingetorix to be well disposed to the Romans, supported his claims. This took place just before the expedition to Britain. On his return from Britain he repaired to Samarobriva (Amiens), where he held a council of the Gaulish deputies. On account of the bad harvest and scarcity of provisions, he was obliged to disperse his legions in various parts of the country for the winter. This proved nearly fatal to the Roman arms. He himself remained in Belgic Gaul to see his legions properly quartered. A fortnight only had elapsed when the Eburones (Tongres), excited by Induciomarus, revolted and attacked the camp of Titurius Sabinus and L. Cotta, who had one legion and five cohorts with them. Ambiorix, king of the Eburones, alarmed Sabinus by telling him that the whole country was in arms, and that the Germans were coming. Much against Cotta's opinion, Sabinus resolved on retiring towards the next Roman garrison, which was exactly what Ambiorix wished. The Romans were attacked on their march by numerous forces, surrounded, and all cut to pieces. Ambiorix, elated with this success, next attacked the camp of Quintus Cicero, brother to the orator, who was stationed with one legion in the country of the Nervii. Quintus made a brave defence. After several days' siege, the Gauls threw combustibles into the camp and set fire to the huts of the soldiers, which were thatched after the Gaulish fashion. At the same time the Gauls advanced to scale the ramparts. But the legionaries stood firm at their post, and Cæsar, having at last received news, through a Gaulish slave, of the danger of his men, marched with two legions to their relief, defeated the Gauls, and entered Cicero's camp, where he found not one-tenth of the soldiers free from wounds. He praised Cicero, he praised the men, he spoke of the catastrophe of Sabinus and Cotta as a consequence of imprudence, and a lesson to other commanders. He then resolved to pass the winter in Gaul, and stationed himself with three legions at Samarobriva. Induciomarus, having attacked Labienus, was defeated and killed.

The following year, 53 B.C., which was the sixth of Cæsar's government, symptoms of general disaffection manifested themselves throughout Gaul. The people had been overawed but not subdued. The harshness and rapacity of the conquerors made the Gauls wish to shake off the yoke; but all their attempts were detached, partial, and not combined, and they failed, after giving, however, full employment to the Romans. It was a year of desultory though destructive warfare. Cæsar obtained of Pompey the loan of one legion, and had recruited two legions more in the Cisalpine province. He had now ten legions (60,000 men) under his orders, which was considered a very large Roman army. He first defeated the Senones, the Nervii, and the Menapii: the Treviri were defeated by Labienus. Cæsar then crossed the Rhine again from the country of the Treviri, having constructed a new bridge a little below the former one. He expected that the Suevi would attack him, but that wary people withdrew inland to the entrance of the great forest called Bacenis (the Harz?), which lay between their territory and that of the Cherusci, and there waited for Cæsar to advance. But the Roman avoided the snare, and withdrew his army across the Rhine, leaving part of the bridge standing for a future occasion. He then marched against Ambiorix and the Eburones, who did not wait for him, but took refuge in the forests and marshes, where they kept up a partizan or guerilla warfare. Cæsar ordered the country of the Eburones to be thoroughly devastated, and invited the neighbouring tribes, Germans and Gauls, to assist in the work of destruction. One German tribe, however, the Sicambri, who had crossed the Rhine for the purpose of booty, thought it expedient to attack the camp of Quintus Cicero, which they had nearly forced. Ambiorix escaped, notwithstanding all endeavours to seize him; but sentence of death was passed against Acco, the leader of the previous revolt of the Senones. His accomplices, who had escaped, were banished. Having put his legions to winter among the Treviri, Lingones, and Senones, Cæsar repaired to Cisalpine Gaul.

The disturbances which occurred at Rome in consequence of the murder of Clodius made Cæsar turn his attention towards that quarter. He raised troops in every part of the Cisalpine province. These rumours spreading among the trans-Alpine Gauls, exasperated as they were by the execution of Acco and Cæsar's fearful vengeance upon the Eburones, they thought the time was come for one great effort while Cæsar was engaged in Italy. The Carnutes began by massacring all the Romans whom they found in the town of Genabum (Orléans). Vercingetorix, a young man of one of the first families of the Arverni, was placed at the head of a confederacy of the whole of Celtic Gaul. The Bituriges joined the league, and the Ædui themselves wavered in their allegiance. Cæsar hearing this news, and seeing that the affairs of Rome had through Pompey's influence assumed a quieter aspect, set off in the middle of winter (beginning of 52 B.C.) for the province of ulterior Gaul, repaired to Narbo, which was threatened by the Gauls; and having collected some troops, crossed the Cebenna and spread alarm through the country of the Arverni, who hastily recalled Vercingetorix to their defence. Having thus effected his object of causing a diversion, Cæsar moved quickly northwards to the country of the Lingones, from whence he went among the Carnutes, attacked and took Vellaunodunum, Genabum, and Noviodunum. Vercingetorix, in a great council of the chiefs, advised, as the only means of harassing the Romans, to burn and destroy the whole country around them. This was executed in the country of the Bituriges, the villages and towns of which were set on fire, except the town of Avaricum (Bourges), which was garrisoned by the Gauls. Cæsar laid siege to Avaricum, and took it after a most brave defence, when the Roman soldiers killed all, old men, women, and children. The next siege was that of Gergovia (near Clermont, in Auvergne), which, after a murderous attempt to storm the place, Cæsar was obliged to raise. The Ædui, till then the firmest allies of Rome, had now thrown off the mask, joined the league, massacred the Romans at Noviodunum (Nevers), and seized the depôts, the baggage, and the treasury, which Cæsar had deposited there. Cæsar's next movement was to the north into the country of the Senones, in order to join Labienus and the legions under him. The defection of the Ædui rendered Cæsar's position in the centre of Gaul very difficult. Having effected a junction with Labienus, he directed his march towards the Lingones and the Sequani. Meantime he was enabled to collect a body of German cavalry from beyond the Rhine, which was of the greatest service to him during the rest of the campaign. Vercingetorix, who followed Cæsar closely, had his cavalry defeated by these new auxiliaries of the Romans, upon which he retired to Alesia (now a village called Saint Reine, and also Alise, near Flavigny and Semur, in North Burgundy, ten leagues N.W. of Dijon). Cæsar immediately invested the place, and began his lines of circumvallation. For this celebrated siege of Alesia we must refer to Cæsar's own account. The whole forces of the Gallic confederation, stated at about 300,000 men, advanced to the relief of Alesia. Cæsar found himself besieged in his own lines, having to fight Vercingetorix from within, and the confederates from without. After a desperate battle, in which the Gauls penetrated into the Roman entrenchments, they were at last repulsed by Cæsar, who was well supported by his lieutenant Labienus. The Gaulish confederates, having sustained a tremendous loss, broke up the camp and returned home. Next day Vercingetorix assembled his council in Alesia, and offered to devote himself to save their lives, by giving himself up to Cæsar. Alesia surrendered, and Vercingetorix was afterwards taken to Rome. Several years after, he walked before the triumphal car of the conqueror; after which he was put to death in prison.

The Ædui and the Arverni now made their submission to Cæsar, who took their hostages, and restored their prisoners. After putting his army into quarters, he stationed himself at Bibracte for the winter. This was the hardest fought campaign of all the Gallic war.

Cæsar's eighth and last campaign in Gaul (51 B.C.) is related by Hirtius, who has continued his 'Commentaries' by writing an eighth or supplementary book. After the great but unsuccessful exertions of the Gauls in the preceding year their spirit was broken, but they still made some expiring efforts. Cæsar easily defeated the Carnutes, where his soldiers made an immense booty. He had more trouble with the Bellovaci (Beauvais), a Belgic nation, who at last submitted and gave hostages, all except Comius, the chief of the Atrebates, who had once been a friend to Cæsar. He had joined in the general revolt of the preceding year, in consequence of his life having been attempted by Labienus, who sent to him Volusenus Quadratus under pretence of a conference, but in reality with orders to kill him. During the interview, a centurion of Volusenus's escort struck Comius and wounded him on the head, when the Gaulish escort interposed and saved Comius's life. From that time Comius swore he would never trust himself to a Roman. This disgraceful transaction, not mentioned by Cæsar, is related by Hirtius (*Bell. Gall.*, b. viii., 23). A revolt in western Gaul was quelled by C. Fabius, who subjugated all Armorica (*Hirtius*, 31). Gutruatus, chief of the Carnutes, who had joined in the revolt, was taken to Cæsar's camp, whipped with rods till he fainted, and then beheaded. Hirtius says that this inhuman act, repugnant to Cæsar's nature, was forced upon him by the clamour of his soldiers. Cæsar next besieged and took Uxellodunum, a stronghold of the Cadurci (Cahors). Here Cæsar's clemency, which Hirtius repeatedly extols, did not prevent him from sentencing all the men who had shared in the defence of Uxellodunum to have their hands chopped off. Cæsar entered Aquitania, the people of which gave hostages. From thence he repaired to Narbo, and there distributed his army in winter-quarters. He placed four legions among the Belgæ, under M. Antonius, afterwards the celebrated triumvir, Trebonius, Vatinius, and Q. Tullius Cicero; two among the Ædui, two among the Turones, and two among the Lemovices, near the borders of the Arverni. He then visited the Provincia, held the courts, distributed rewards, and went to winter at Nemetocenna (Arras), then within the limits of the country called Belgium. During the winter he endeavoured to heal in some measure the wounds which he had inflicted upon the unfortunate countries of Gaul. He endeavoured to conciliate the principal inhabitants by great rewards, treated the people with kindness, established no new taxes, and by rendering the Roman yoke smooth and light, he succeeded in pacifying Gaul, exhausted as it was by so long and so unfortunate a struggle.

In the spring, 51 B.C., he set off for Italy, where he was received by all the municipal towns and colonies of his government with great rejoicings. On his return to Belgic Gaul he reviewed his troops, and soon after returned to the north of Italy, where the dissensions between him and the senate had begun which led to the civil war. This was the ninth and last year of Cæsar's government of the Gauls.

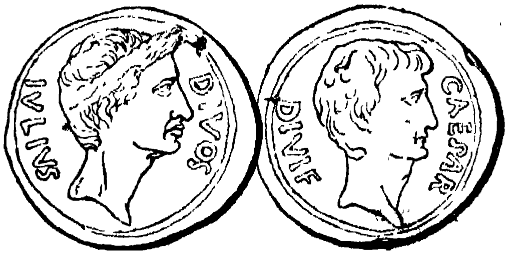
Before the close of his Gallic campaign, Cæsar had probably determined not to divest himself of the command of his army. He feared, and apparently with good reason, that if he were once in the power of his enemies at Rome, his life would be in danger. His connection with Pompey had been dissolved by the death of Julia without any surviving offspring, and by the growing jealousy and fear with which his success in Gaul and his popularity with his army had filled all the aristocratical party. Cæsar's object now was to obtain the consulship a second time, and a special enactment had been already passed enabling him to stand for the consulship in his absence. But Pompey, who at last was roused from his lethargy, prevailed upon the Senate to require him to give up the command of the army and come to Rome in person to be a candidate. Cæsar, who was now at Ravenna, in his province of Gallia Cisalpina, sent Curio to Rome with a letter expressed in strong terms (Cic. *Ep. ad Div.* xvi. 11), in which he proposed to give up his army and come to the city, if Pompey would also give up the command of the troops which he had. These troops of Pompey comprised two legions which had been taken from Cæsar; and by a decree of the Senate were designed for the Parthian war, but had been illegally put into the hands of Pompey by Marcellus the consul. The Senate, acting under the influence of Pompey and Metellus Scipio, whose daughter Pompey had married, passed a decree that Cæsar should give up his army by a certain day, or be considered an enemy to the state. The tribunes, M. Antonius and Q. Cassius, the friends of Cæsar, attempted to oppose the measure by their *intercessio*, which was perfectly legal; but their opposition was treated with contempt, and thus they gained, what they were probably not sorry to have, a good excuse for hurrying to Cæsar with the news. (Cic. *Ep. ad Div.* xvi. 11.) Upon receiving the intelligence, Cæsar crossed the Rubicon, a small stream which formed the southern limit of his province, and directed his march towards the south. The city was filled with confusion—councils were divided and hesitating—and Pompey, who was the commander-in-chief on the side of the Senate, was unprovided with troops to oppose the veterans of the Gallic wars. Domitius, who had thrown himself into Corfinium to defend the place, was given up to Cæsar by his soldiers, who joined the invading army. The alarm now became still greater, and it was resolved by the senatorial party to pass into Greece, and for the present to leave Italy at the mercy of Cæsar's legions. Pompey, with a large part of the Senate and his forces, hurried to Brundisium, whence he succeeded in making good his escape to Dyrrachium, in Epirus, though Cæsar had reached the town some days before Pompey left it.

From Brundisium Cæsar advanced to Rome, where he met with no opposition. The Senate was assembled, with due regard to forms, to pass some ordinances, and there was little or nothing to mark the great change that had taken place, except Cæsar's possessing himself of the public money, which the other party in their hurry had left behind. His next movement was into Spain, where Pompey's party was strong, and where Afranius and Petreius were at the head of eight legions. After completely reducing this important province, Cæsar, on his return, took the town of Massilia (Marseilles), the siege of which had been commenced on his march to Spain. This antient city, the seat of the arts and of polite learning, had professed a wish to maintain a neutral position between the two rival parties (*Bell. Civil.* i. 35) and their respective leaders. We might infer from one passage in Strabo, that Marseilles suffered severely either during or immediately after the siege (Strabo, p. 180); but another passage seems to imply that the conqueror used his victory with moderation. (Strabo, pp. 180, 181.)

The title of Dictator was assumed by Cæsar on his return to Rome; but he made no further use of the power which it was supposed to confer than to nominate himself and Servilius consuls for the following year (B.C. 48). The campaign of the year B.C. 48 completed the destruction of the senatorial party. It is given at length in the third book of the *Civil Wars* (where, however, there appears to be a considerable lacuna), and comprises the operations of Cæsar and Pompey at Dyrrachium (now Durazzo), and the subsequent defeat of Pompey on the great plain of Pharsalus, in Thessaly. Surrounded by near 200 senators, who acted like a controlling council, with an army mainly composed of raw, undisciplined recruits, the commander-in-chief, whose previous reputation was more due to fortune than to merit, was an unequal match for soldiers hardened by eight years' campaigns, and directed by the energies of one skilful general. It seems difficult to comprehend the movements of Pompey after the battle. He turned his face to the east, once the scene of his conquests, but he had no friends on whom he could rely, and instead of going to Syria, as he at first intended, he was compelled to change his course, and accordingly he sailed to Pelusium, in the Delta of Egypt. Cæsar, who had pursued him with incredible celerity (*Bell. Civil.* iii. c. 102), arrived a little after Pompey had been treacherously murdered by Achillas, the commander of the troops of the young king Ptolemy, and L. Septimius, a Roman, who had served under Pompey in the war with the pirates. Pompey was fifty-eight years old at the time of his death.

The events which followed the death of Pompey need only be rapidly glanced at. The disputes in the royal family of Egypt and the interference of Cæsar brought on a contest between the Romans and the king's troops, which ended in a new settlement of the kingdom by the Roman general. (See the book on the Alexandrine war.) Here Cæsar formed his intimacy with Cleopatra, then in her 23rd year. Cleopatra afterwards followed him to Rome, where she was living at the time of Cæsar's death [CLEOPATRA]. Early in the following year, B.C. 47, Cæsar marched into the province of Pontus, and entirely defeated Pharnaces, the son of Mithridates, who had exercised great cruelties on the Roman citizens in Asia. He returned to Italy in the autumn, by way of Athens. At Brundisium he was met by Cicero (Plut. *Cic.* 39), who was glad to make his peace, and had no reason to be dissatisfied with his reception. On his return to Rome, Cæsar was named Dictator for one year, and consul for the following year, with Lepidus. During the winter he crossed over into Africa, where the party of Pompey had rallied under Scipio, gained a complete victory at the battle of Thapsus, and was again at Rome in the autumn of B.C. 46. In the year B.C. 45, Cæsar was sole consul, and Dictator for the third time. During the greater part of this year he was absent in Spain, where Cn. Pompey, the son of Pompey the Great, had raised a considerable force, and was in possession of the southern part of the Peninsula. The great battle of Munda, in which 30,000 men are said to have fallen on the side of Pompey, terminated the campaigns of Cæsar. Pompey was taken after the battle, and his head was carried to Cæsar, who was then at Hispalis (Séville).

On his return to Rome, Cæsar was created consul for ten years and Dictator for life. On the ides (15th) of March, B.C. 44, he was assassinated in the senate-house [BRUTUS]. After his death he was enrolled among the gods (Sueton. *Cæsar*, 88), under the appellation of DIVOS IVLIVS, as appears from his medals.



[Brit. Mus. Actual size. Bronze. Weight 347¼ grains.]

Cæsar did not live long enough after acquiring the sovereign power to rebuild the crazy fabric of Roman polity which he had demolished in fact, though not in form. But a state which had long been torn in pieces by opposing factions—whose constitutional forms served rather to cherish discord than to promote that general unity of interests without which no government can subsist—where life and property were exposed to constant risk—could find no repose except under one head. A bloody period followed the death of Cæsar, but the fortune of his name and family at last prevailed, and Rome and the world were happier under the worst of his successors than during the latter years of the so-called republic.

The energy of Cæsar's character—his personal accomplishments and courage—his talents for war—and his capacity for civil affairs—combine to render him one of the most remarkable men of any age. Though a lover of pleasure, and a man of licentious habits, he never neglected what was a matter of business. He began that active career which has immortalized his name when he was forty years of age—a time of life when ordinary men's powers of enterprize are deadened or extinguished. As a writer and an orator he has received the highest praise from Cicero; his Commentaries, written in a plain, perspicuous style, entirely free from all affectation, place him in the same class with Xenophon and those few individuals who have successfully united the pursuit of letters and philosophy with the business of active life. His projects were vast and magnificent; he seems to have formed designs (Suetonius, *Cæs.* 44) far beyond what the ability of one man could execute, or the longest life could expect to see realised. His reform of the Roman calendar, under the direction of Sosigenes, and his intended consolidation of the then almost unmanageable body of Roman law, do credit to his judgment. He established public libraries, and gave to the learned Varro the care of collecting and arranging the books. Of the eight books of his Commentaries, the last is said to have been completed by some other hand. The three books of the Civil War were written by Cæsar; but the single books on the Alexandrine, African, and Spanish wars, respectively, are generally attributed to another hand, though it is not at all unlikely that Cæsar left the materials behind him. He wrote a number of other things, the publication of which Augustus suppressed. The editions of the Commentaries are very numerous; the best is that of Oudendorp, Leiden, 1757, 4to. They have been frequently translated into Spanish, French, English, Dutch, German, and Italian. The Greek translation of seven books of the Gallic War, attributed to Planudes, was first printed in Jungermann's edition, Frankfort, 1606, 4to. (See the articles ANTONINE'S ITIN.; ACTA; AUGUSTUS; POMPEY.)

CÆSAR'EA (Καισάρεια), the name of several towns so called in honour of the Roman Cæsars. Cæsaréa, now Kesarieh, the capital of Cappadocia (according to Stephanus Byz.), or in Cilicia (according to Strabo), at the foot of Mount Argæus, was originally called Mazaca. (Strabo, p. 537.) Kesarieh is still a considerable town. Cæsarea in Palestine, on the sea-coast (*Acts* viii. 40., xxiii. 23), the birthplace of Eusebius Pamphili, received that name from King Herod, in compliment to Augustus Cæsar: under Vespasian, it became a colonia and received the name of Flavia. Another Cæsarea in Palestine, north of the sea of Galilee, is distinguished from that just mentioned by the name of Philippi (*Matth.* xvi. 13), having been repaired by Philip the tetrarch. [BANIAS.] Sometimes a town received a name compounded of both the titles, Cæsar and Augustus, as Cæsar Augusta, Sar-agossa, in Spain [AUGUSTA].

CÆSIUS BASSUS, a Roman lyric poet, who lived in the reign of Nero and Vespasian. Persius addressed his sixth satire to him. Quintilian (xi. i.) speaks of him as perhaps next, but still very inferior to Horace. The Scholiast on Persius (Sat. vi. i.) says that he was burnt with his house in an eruption of Mount Vesuvius.

CÆSU'RA, or its Greek equivalent τομή, (that is, *cutting*, the two words being respectively derived from the stems *caed* and *tem*, cut,) is the name given by antient grammarians to the division of a verse into two or more portions by a pause or pauses, the position of which must be consistent both with the rhythm of the metre and the meaning of the words. If in any metre the termination of every foot coincide with the termination of a word, a painful monotony arises which would soon offend the ear; as in the lines,—

> Sparsis hastis longis campus splendet et horret.—*Enn.*
> Disperge hostis, distrahe, diduc, divide, differ.—*Enn.*
> Hæc res ad te scriptas Luci misimus Aeli.—*Lucil.*

This has led some grammarians to hold the opinion that the several feet of a verse should be blended together; yet this principle might lead to results no less offensive than the lines that have been just quoted, as may be seen in the following verses:—

> Sole cadente juvencus aratra reliquit in arvo.
>
> Πολλα δ' αναντα καταντα παραντα τε δοχμια τ' ηλθον.

Much that has been written about the cæsura betrays an inaccuracy, which has arisen from a neglect of the principle of accent. Those who define verses by the mere order of the long and short syllables find it necessary afterwards to lay down what appear to be arbitrary canons. Thus a word of three long syllables, such as *prorumpunt*, might, according to the usual definition of an hexameter verse, occupy any place which did not interfere with the two short syllables of the fifth foot. Yet an ear acquainted with the true rhythm of this verse would be violently offended by any line beginning with *Et prorumpunt*, or *Continuo prorumpunt*, or *Continuo nostri jam prorumpunt ululantes.* The true objection to these lines is that the accent of the word *prorumpunt*, which of course falls upon the penult, is inconsistent with the demands of the verse, which, in the positions here given to the word, would compel us to falsify the accent, and pronounce *prórumpúnt*. [HEXAMETER.] A part of these difficulties they evade by adding to the previous definition of the hexameter a canon to the effect that there must always be a cæsura at the end of two feet and a half, or three feet and a half, with the additional proviso that the syllable immediately preceding the cæsura must not be a monosyllable. To this canon there are two serious objections besides its arbitrary character: one that it does not exclude *prorumpunt* from its position in the third example; the other that it lays down a rule which is violated in many of the finest verses of the Æneid. The same neglect of accents has led to precisely the same difficulties in the other metres.

On the best places for the pause in the particular metres, see DACTYLICS, HEROIC VERSE, LYRICS, IAMBICS, TROCHAICS.

The name of cæsura or τομη (or κόμμα, which has the same meaning) is sometimes given to that portion of a verse which precedes the pause. Thus when the pause occurs at the end of the fourth foot of the hexameter, that fourth foot being a dactyl, which is common in the bucolic writers, the four first feet so cut off bear the name of a bucolic cæsura.

(Hermanni *Elem. Doctr. Metr.*, pp. 32-37 and 334-343.)

CAFEIC ACID, a peculiar vegetable acid existing in coffee, from which it is separated by precipitating the decoction of coffee with a solution of acetate of lead, and the subsequent action of the subacetate, sulphuretted hydrogen, and alcohol.

Cafeic acid separates from solution in alcohol in the state of brown translucid scales. One of the principal characters of this acid is the aromatic odour of burnt coffee which it yields by dry distillation; when the decomposition is complete, it is dissipated without any residue.

Cafeic acid appears to exist in coffee, combined lime, magnesia, alumina, and iron. The alkaline cafeates are of a pure brown colour without any admixture of green, and by evaporating the solutions they are obtained in the state of brown horny masses. Lime and barytes water are precipitated of a yellow colour by cafeic acid; these precipitates are soluble in nitric acid. Cafeic acid does not alter the colour of solutions of the persalts of iron; it precipitates a solution of albumen, but the supernatant fluid has not a slight green tint, which distinguishes it from the tannin of coffee. [COFFEE.] According to Pfaff, cafeic acid is composed of

Carbon	29·1
Hydrogen	6·9
Oxygen	64
	100·0

CAFEINE, a neutral vegetable product obtained from coffee, and which was at first supposed to be an alkali. It is procured from the decoction by the action of acetate of lead, sulphuretted hydrogen, &c. Its properties are that during the cooling of a concentrated solution it crystallizes in slender flexible needles, which are opaque and of a silky lustre; when they are obtained by slow spontaneous evaporation, they are long fine prisms, which are transparent and but slightly flexible. Cafeine has little taste, but it is bitter and disagreeable. It requires 50 parts of cold water to dissolve it; but hot water takes up a much larger quantity, and on cooling a crystalline magma is obtained. It is not very soluble in anhydrous alcohol, but readily so in alcohol of 70 or 80 per cent. In æther and oil of turpentine it is insoluble. Acids and alkalis do not combine with or alter it, but they dissolve it more readily than water. Cafeine readily fuses, becomes transparent, and sublimes without residue, and concretes in crystals resembling those of benzoic acid. The salts of iron, copper, and lead produce no effect when mixed with solution of cafeine.

According to Pelletier and Caventou, this substance is composed of

Carbon	46·51
Hydrogen	4·81
Oxygen	27·14
Azote	21·54
	100

This substance is distinguished from most others which contain azote in not putrefying when a solution is exposed to the air in a warm place, and in not being precipitated by infusion of galls.

CAFFA. [KAFFA.]

CAFFILA is the term used in Northern Africa for those companies of travelling merchants which in Asia are called caravans. The order in which they are arranged is the same, but the caffilas being generally less numerous than the caravans, this order is not so strictly observed.

CAFFRARIA, CAFFRELAND, or more properly **KAFIRLAND**, from the Arabic word 'Kafir,' which means 'unbeliever,' 'not Mussulman,' is the name given by Europeans to the eastern part of S. Africa, from the N.E. frontiers of the Cape colony, about 32° S. lat. to Delagoa Bay, or perhaps to Cape Corrientes or Inhambane in 24° S. lat. But the Caffre race extends still farther N.; perhaps as far as the Zambezi River, N. of which are the Makooas and other genuine negro tribes. The natives whom Salt saw at Sofala Bay, 20° S. lat., he conceived to be nearly allied to the Caffres. The various Betchouana tribes, as well as the Makweens and others to the N.E. of them and the Damaras on the W. or Atlantic coast, between 22° and 25° S. lat., are of the Caffre race [BETCHOUANA]. The complexion of the Caffres varies from a yellowish brown or copper hue to that of deep black, but this last colour is not very common. The nose approaches to an arched form; they have thick lips and hair curly, but less woolly than the negroes. The Caffre females are among the handsomest in Africa.

The Arabian and other Mussulman traders and conquerors who formed establishments on the Mozambique coast, bestowed the general appellation of Kafir on the native population, with whose name they were unacquainted. This was especially the case with the coast S. of Cape Corrientes, which the eastern navigators always dreaded, as destitute of harbours and inhospitable, and on which therefore they made no settlements. The Portuguese who succeeded the Arabs on the Mozambique coast adopted the word Caffra and Caffraria for this extent of coast, upon which for similar reasons they did not venture. The name has been adopted by the Dutch and the English also, through the natives themselves are unacquainted with it.

Caffraria, properly so called, extends for about 600 miles along the coast, from the Great Key River to Dalagoa Bay, and inland as far as the high land which divides the waters that flow into the Indian Ocean, from those which flow into the Orange river and the Atlantic, and separates the land of the Caffres from that of the Koranna Hottentots, the Bosjesmans and the Betchouana tribes. It runs in a N.E. direction at an average distance of about 100 miles from the sea. The eastern or Caffre side of the ridge is more abrupt than the western, which slopes in a sort of table-land towards the Atlantic. Caffraria is a land of rugged hills and deep valleys. The following sketch is by Lieutenant Steedman.

In travelling through the Amaponda country (between the St. John River and Port Natal), the waggon path lies over an undulating ridge, three or four miles in breadth, and about 800 or 1000 feet above the level of the sea: numerous streams are seen rushing down the deep ravines and valleys; the country is rugged and hilly, exhibiting valleys, ravines, beds of rivers, bush and forest covering the declivities of some of the hills, while the others look bare and red from the iron ore which they contain. Caffre villages are scattered about, and numerous herds of cattle are seen grazing in the plains, while the lower sides of the hills exhibit patches of cultivated ground in all kinds of irregular shapes. To the eastward the view is bounded by the Indian Ocean, which is just visible on a clear day, while to the westward a high ridge of mountains is seen extending for a length of from fifty to sixty miles, which separates the country of the Tambookies from the deserts of the Bosjesmans, which lie in the direction of the Orange River. Beasts of prey are not numerous: now and then a lion, and more frequently a tiger, or rather leopard, are met prowling in the more secluded ravines. Elephants were once numerous, but are now become scarce, except in the large forests near the St. John River and Port Natal. The hippopotamus is found in most of the rivers, and its flesh is eaten by the natives. Rhinoceroses lurk about the thick bushy coverts, as well as hyænas of a very ferocious species. The country abounds in game, antelopes, hares, pheasants, and partridges. There are quantities of baboons and monkeys, and also serpents and other reptiles. Copper and iron ore is found in the mountains.

Four principal nations, originally of one stock, occupy the country from the frontiers of the Cape colony to Dalagoa Bay, the Amakosa, the Amatimba, called by the Dutch Tambookies, the Amaponda or Hambona, whom the Dutch have christened Mambookies, and the Vatvahs or Zoolahs, sometimes called Amozoolah. The chief of the Amakosa was until lately the well-known Hintza, who resided on the left or E. bank of the Great Key River. Gaika, one of his subordinate chiefs, resided on the right bank of the Key, and between that and the Keiskamma, and on the immediate borders of the colony. To the N. and E. of the Amakosa are the Amatimba, whose westernmost districts border on the back territory of the colony, towards the sources of the Zwart or Black Key. Vosani, the chief of the Amatimba, died in 1830. The third tribe, the Amaponda or Hambona, dwell eastward of the Amatimba, and extend along the coast towards Port Natal. Their Umkumkani, or great chief, is called Fako, and is said to be powerful; one of their subordinate chiefs, Dapa, is the son of an Englishwoman, who was wrecked on this coast. The Amaponda are said to be a numerous tribe, and more industrious than the Amakosa and Amatimba: whilst the latter leave all the labour of the field to their women, the Amaponda men work as well as the women; they grow millet or Caffre corn, beans, pumpkins, sweet potatoes or yams, maize, and tobacco. In the Amaponda territory a small tribe of mixed European and Caffre blood has been discovered, the descendants of the crew of some vessel wrecked on this coast. (Captain Riou's *Narrative of Van Reenen's Expedition*, London, 1792.)

The fourth great tribe of Caffres, and the farthest from the Cape, is the Zoolas or Vatvahs, who under their chief Chaka have overpowered, dispersed, or destroyed all the surrounding tribes, from King George's River N. of Dalagoa Bay down to Port Natal, a tract of above 300 miles in length from N. to S. The Oratontahs, who in 1821-22—ravaged the country near the Portuguese settlement at Dalagoa Bay are the same people as the Vatvahs. The Vatvahs were originally a small tribe; they came about fifteen or twenty years since from the N., somewhere about or beyond the mountains W. of English River, which falls into Dalagoa Bay. Their language is different from that of the Amakosa and other southern Caffres, and is said to have more affinity to the Sichuana or Betchouana language. The Vatvahs are well acquainted with the use of iron, and some of them have muskets, which they obtained from American traders at Port Natal. They are a fine athletic race; in war they carry large oval shields of bullock's hide, and an umconto or spear, besides a bundle of assagais. Chaka brought his warriors into a most strict state of discipline, any deviation from which he punished with death. He is described as sanguinary and cruel, like all barbarian conquerors; but he received kindly, in 1825, Lieutenant Farewell, Mr. Fynn, and other Englishmen, and allowed them to settle in his dominions near Port Natal, and granted them a large extent of country, and men to assist them in cultivating it. There is an account of their visit to him, and of the habits of the people, in the appendix to Thompson's 'Travels and Adventures in South Africa.' The country is represented as very fine, rich in pasture, and abounding with cattle. The Vatvahs go generally naked, except when they put on their war-dress, consisting of skins round the middle, and feathers on the head; the women wear an apron of hide about the middle. Two traders from the Cape, Messrs. Scoon and M'Luckie, after visiting in 1827 the town of Kurichane in the Moorootzee country, crossed the river Marriqua, and travelled first eastward and then southward, for about 140 miles, to the town of Malakatzee, a Zoolah chief, where they traded to the amount of 1800*l.* sterling.

The tribes who live in the lowlands round Dalagoa Bay are said by Captain Owen (*Voyages to explore the Coast of Africa*) to be industrious, well-behaved, and favourably disposed to trade with strangers. He mentions the arrival at Dalagoa Bay of a caravan from the interior, consisting of 1000 natives, with from 300 to 400 elephants' tusks, and a great quantity of cattle. Captain Owen represents the people as honest in their manner of dealing; their prudence will not allow them to give their merchandize for the momentary gratification of rum or tobacco; but they have a great desire for cloth. A similar observation was made, more than three centuries ago, by Vasco de Gama as to the natives whom he saw about Cape Corrientes. In the 'Narrative' by the late Captain Boteler, (1835), are found also many particulars concerning the natives of Dalagoa Bay, and those of Inhambane and Sofala, who are all considered to be of the Caffre race.

Of the countries to the N. of Dalagoa Bay we know very little. The Makweens are known to be in that direction, perhaps 200 miles to the N.W.; their country is a highland, and is said to rise several thousand feet above the sea. The great western ridge which divides the waters that flow into the Indian Ocean from those of the Gariep is distinctly seen from Dalagoa Bay. An expedition, under Captain Alexander, was to proceed by sea to Dalagoa Bay in 1835, and thence to set off for the interior to explore King George's River or Manica, and to ascertain its identity with the Marique of the Moorootzee and to open, if possible, a communication with the Makween country. The instructions given to Captain Alexander are found in the fourth volume of the 'Journal of the London Geographical Society,' 1834. We have as yet seen no account of Captain

Alexander's arrival at Dalagoa Bay. Another expedition under Dr. Smith, set off in 1834 to explore the sources of the Mapoota River, and lately returned to Cape Town. The report is said to be most satisfactory.

Of the manners and habits of the southern Caffres who are nearer the borders of the Cape colony, we have accounts from several late travellers, Thompson, Steedman, Moodie, Rennie, &c. The account by the Rev. Mr. Brownlee, a missionary, who resided seven or eight years among them, is perhaps the most full and satisfactory, and is given in the appendix to Thompson's 'Travels.' The government of the Caffres is a sort of clanship system. The population of each Caffre tribe is divided into kraals or hamlets, containing from ten to twenty families, each family occupying a separate hut. There is a petty chief in each kraal, who exercises a kind of patriarchal authority over the people. A higher chief rules over a whole district, containing a certain number of kraals. These higher chiefs are hereditary and independent of each other, although they acknowledge to certain extent the authority of the Umkumkani, or great chief of the whole tribe, whose counsellors they are, and who cannot determine upon any important measure concerning the whole tribe without consulting them. The chief, like most Asiatic and African sovereigns, is supposed to be the original possessor of all the land and cattle within his territory. This pretended right, however, is seldom acted upon, but an acknowledgment of it is retained in the custom, that no individual is allowed to kill any of his cattle without permission of the chief, who claims part of the carcase as his right: likewise the first fruits of the season are not allowed to be gathered without permission of the great chief of the tribe. The right of individual families to the land is restricted to the patches of ground which they have enclosed for cultivation; all the rest is held in common by the different families of each kraal for grazing their cattle. The Caffres have no written laws, but certain long-established principles and usages, any infraction of which by a chief would be opposed by his subjects at large. There is however an evident disposition on the part of the chiefs to make themselves absolute, as Chaka succeeded in doing among the Zoolahs. A great engine of despotism is found in the Amakira or witch doctor, who acts as a sort of inquisitor; and when in secret understanding with the chief, serves him to remove out of the way or frighten all those who might have opposed him. The unfortunate individual accused of witchcraft is put to a cruel death, and his cattle divided among his accusers. In other matters the punishment of death is not common, most offences being expiated by a fine, excepting robbery on the property of a chief. The Caffres acknowledge the existence of a supreme being, for whom they have several names in their language, but they have no form of worship, and their notions of a future life are very vague and unsettled. They have no idols, but have other superstitions, believe in witchcraft, spirits, apparitions, and they sacrifice animals to propitiate the ghosts of the dead. A Caffre swears by the spirit of his father, or by his chief. They circumcise boys at the age of twelve or fourteen, and the ceremony is attended with considerable solemnity; they seem however to have no distinct idea of the object of the practice, or whence they derived it. They have a decided aversion to swine-flesh, and also it is said to fish, except shell-fish: accordingly they have neither boats, canoes, nor nets, or other implements for fishing.

The huts of the Caffres are hemispherical, and mostly from eighteen to twenty feet in diameter, and from six to seven feet high. Poles are stuck into the earth, and flexible boughs are twisted between and arched over the top; they then are thatched with straw, and plastered over with clay or cow-dung; a small aperture is left for the door, which is made of basket-work. The fire-place is in the centre of the hut, and there is no aperture to let out the smoke but through the doorway. A few mats, coarse earthenware pots of native manufacture, a rush basket so closely woven as to contain liquids, a calabash, and a bundle of assagays—these constitute all the furniture of a common Caffre hut. Some have milk sacks made of bullock's hide, and wooden vessels carved out of soft wood. They preserve their millet or corn in pits dug in the ground, like the Berbers and other North Africans. The karess, or cloak made of softened hide, is the dress of both men and women. The females wear besides a petticoat of leather round the loins, and usually also a covering over the bosom: the men go often totally naked. The beauty of the Caffre women has been much spoken of, and probably exaggerated. The men are tall, straight, robust, and muscular, firm of carriage, open and manly in their manners, and when at peace have a remarkable expression of good nature on their countenance. They bring to market, on the borders of the Cape colony, elephants' tusks, gum, hides, mats, rush baskets, &c. to a considerable amount. As yet the southern Caffres, unlike their brethren of the Betchouana and other northern tribes, hold European cloth in little estimation, but are very fond of beads and other ornaments; they also purchase knives, tinder-boxes, and other hardware articles.

The result of the last Caffre war in 1835 has been to extend the limits of the colonial territory, from the Keiskamma, the former boundary, as settled by a treaty with the late Gaika, to the Great Key River, by which a large and fine tract of country has been evacuated by the Amakosa, and left at the disposal of the British authorities. Another result has been, that a tribe called Fingoes, who were the remains of a numerous race, who between ten and twenty years had lived N. of Port Natal, whence they were driven away by Chaka and thrown for refuge among the Amakosa, by whom they were treated as bondsmen or as a sort of Helots, having claimed the protection of the British government, have been removed from their state of bondage and brought into the colony, where they have been located, to the number of 17,000 individuals, between the lower Keiskamma and Great Fish Rivers. The Fingoes are spoken very favourably of, and may become very useful colonists, and form an efficient border militia. (Account by Captain Alexander on the Caffre war, in the fifth volume of the *Journal of the Geographical Society*, 1835.)

There has been evidently of late years a pressure of tribes from the N. upon the southern Caffres, and it becomes an important question how the latter are to be assisted and protected against extermination or starvation. Hintza, the late Umkumkani or great chief of the Amakosa, finding that the Fingoes, weary of oppression, wished to place themselves under British protection, began to decimate them; and when Sir Benjamin D'Urban, the governor of the colony, remonstrated with him on this act of cruelty, Hintza replied, 'What is all this about? Cannot I kill my dogs if I choose?'

CAFFRISTAN, a region to the N. of Cabul, bounded on the N.E. by Cashgar: on the N. by Badakshan; on the N.W. by Koondooz; and on the W. and S. by Cabul: its boundary to the E. is not defined, but is said to extend to the N. part of Cashmere. This region stands at a considerable elevation, and occupies a part of the Hindu Cosh Mountains, a name sometimes given to that part of the Himalaya chain which lies W. of the N.E. point of Cashmere. The height of one of the peaks of the Hindu Cosh Mountains has been stated at 20,493 feet, and on this and the heights connected with it, the snow remains throughout the summer, while the thermometer in the nearest valley stands at 113° Fahrenheit. There are no roads, properly speaking, the only travelling being along foot-tracks, which are frequently obstructed by rivers and mountain-streams, and these are crossed either by wooden bridges, or by swinging bridges made of the pliant withes of trees.

No cultivation is carried forward on the hills, some of which are covered with pine forests, while others afford sustenance to numerous flocks of goats. The valleys are mostly of small extent but very fertile, and produce abundant crops of wheat and millet, with large quantities of grapes, which form an important object of cultivation. These valleys, besides, furnish pasturage for sheep and cattle.

The people, to whom the name of Caffres or infidels has been given by their Mohammedan neighbours, and hence the name of this region, Caffristan, have no general name by which they distinguish themselves, but are split into numerous tribes, each of which has a name peculiar to itself. The only accounts we have of their characters and habits are derived from the various tribes of Mohammedans by whom they are surrounded and with some or other of whom they are constantly at war. In their persons the Caffres are a fine race of people, with handsome features and fair complexions; the distinction made between different tribes, some of whom are called black Caffres and others white Caffres, is derived from a peculiarity in the dress of the former, who clothe themselves in black goatskins with the hair outside; other tribes wear dresses made of white cotton.

As regards their civil government, it does not appear that the Caffres acknowledge any general head, each tribe being governed in all things by its own rulers, and engaging at times in feuds with other tribes. Their hostile feelings towards their Mohammedan neighbours are probably engendered by the incursions which these are constantly making for the purpose of carrying off the Caffres as slaves: the captives thus made are mostly females, who are much sought after on account of their beauty. The hatred thus caused shows itself in many of the customs of the people of Caffristan. Until they shall have slain a Mohammedan the men go constantly bareheaded, but after this proof of prowess they wear turbans in which long feathers are placed, their number indicating the number of foreign enemies who have fallen by the hand of the wearer. The same information is conveyed by means of bells worn round the waist, their number being regulated in the like manner. A Caffre who has not slain a Mohammedan is besides not allowed to flourish his hatchet during the dance. Peace is sometimes made between the Caffre tribes and their neighbours, when they are ready to extend towards their former enemies all the rites of hospitality. Their warlike weapons are a bow about 4½ feet long and arrows of reed with barbed heads, which are sometimes poisoned. For closer conflict they are each provided with a dagger and a knife: recently they have begun to adopt the use of swords and muskets, in imitation of their enemies.

The Caffre villages are mostly built on the slopes of hills, the houses, which are made of wood, being placed one above another, the roof of the lower house forming a pathway to the one above it. One of these villages is said to contain 500 houses.

In their religion the Caffres are said to acknowledge only one supreme God, to whom they apply the name of Dagun, but they worship numerous idols, the representatives of great men of former times, and who are supposed to intercede with the Deity in favour of their worshippers. It is in agreement with this account that the idols of one tribe have no reputation for sanctity with the other tribes. It does not appear requisite for imparting this sanctity that any lengthened period must elapse after the death of a man so honoured, his contemporaries being willing to pay their worship to his effigy immediately after his decease. When he dies, the Caffre is dressed in his best clothes, and is placed upon a bier with his weapons beside him; his male relations then carry him about with singing and dancing, while the females give themselves up to lamentation, after which the body is inclosed in a sort of coffin and left in the open air, usually under the shade of a tree.

A Caffre man procures his wife by purchase, paying to her father sometimes as many as twenty head of cattle, or sheep and goats in proportion. Domestic slavery is practised, the slaves being natives of Caffristan, sometimes taken in feuds with hostile tribes, and sometimes being orphans of their own tribe, it being not uncommon for the more powerful men to seize children who are unprotected, and either to sell them to some neighbouring country or to retain them in slavery.

The more usual food of the people is bread, cheese, butter, and milk: they likewise eat beef, mutton, and bears' flesh. They have a variety of fruits, among which are grapes, apricots, apples, almonds, and walnuts. They make three sorts of wine, viz., red and white, and a kind having nearly the consistency of jelly which is very strong: both males and females are said to drink occasionally to excess. The favourite amusement when they meet together is dancing: their music consists of a pipe and tabor.

Several dialects are spoken by the different tribes in Caffristan, but there are many words which are common to the whole people: the original language is supposed to have been derived from the Sanscrit. No estimate has been made of the numbers of the people. (Elphinstone's *Cabul.*)

CA'GLIARI (the Roman Caralis or Carales), the principal town of Sardinia, and the residence of the viceroy, is in the south part of the island, on the fine bay of the same name, in 39° ' N. lat., and 9° 7′ E. long. It is built partly on [illegible] sea-side, and partly on the slope of a steep hill on the highest part of which is the castle, with the royal palace. The town is divided into four districts, Castello, Stampace, Marina, and Villanova. The population in 1825 was 27,380 (*Calendario Sardo*). Cágliari is an archbishop's see, which dates from the beginning of the fourth century. St. Lucifer was one of its earliest bishops. There is a university, with the four faculties of theology, law, medicine, and philosoph[illegible] belles lettres; a library of 15,000 volumes; a museum [illegible] good collections of minerals, birds of the island, and [illegible]als, including some of the Carthaginian period: a royal society of agriculture and public economy, [illegible] the nobility, a diocesan seminary, a pub[illegible] and several elementary schools established since [illegible]. The cathedral, a large building, rich in marbles, [illegible] built by the Pisans during their possession of the island. There are many other churches; ten convents of men, two of which are Scolo[illegible] who keep public schools, and one of Ospedalieri, w[illegible] an hospital for the sick; and four convents of wome[illegible] reale audienza or high judicial court for the south [illegible] of the island sits at Cágliari, as well as the commercial tribunal. The town enjoys great municipal privileges and revenues. The harbour is safe, and large ships find good anchorage in the bay. Cágliari is the chief port of [illegible]dinia, and almost the only one frequented by foreign vessels. In 1831, 210 ships cleared out of the port of Cágliari, of which 159 were Sardinian, 20 Neapolitan, 10 Austrian, 6 French, 5 Swedish, 4 English, &c. Cágliari exports cheese, wine, oil, salt, flax, hides, and horses. The importation of foreign goods into Sardinia amounts to above four millions of francs annually. Near Cágliari are extensive saline works, in which salt is collected from the sea-water. There is a royal manufactory of tobacco, the plant being cultivated in the north part of the island. Cágliari is the head town of an intendenza or province, which includes the southernmost part of the island, with a population of 112,000. It is bounded on the north by the province of Isili, on the north-east by that of Lanusei, and on the west by that of Iglesies. It is divided into four districts, Cágliari, Sinnai, Guasila, and Siliqua. The principal town besides Cágliari is Quarto, about 5 miles east of Cágliari; population 5000: it is known for its Malmsey wine. There are several towns of between 2000 and 3000 inhabitants. The [illegible]t and west districts of the province are mountainous, but the central tract north of Cágliari is a fine and rich plain called Campidano, watered by the Ulla and its affluents. The Ulla enters the sea west of Cágliari. The air of the plains is rather unwholesome in the summer months, especially to foreigners. A good carriage-road, lately finished, leads from Cágliari to Sassari and Porto Torres, through the whole length of the island.

CAGLIA'RI, PAOLO, called **PAOLO VERONESE**, from the place of his birth, was the most eminent master in what may be termed the ornamental style of painting. He was born at Verona, in the year 1532, according to Ridolfi, but more probably in 1530. His father, Gabriele Cagliari, was a sculptor, and originally intended his son for his own profession; but in consequence of the boy's determined preference for the sister art, he was placed under his un[illegible] Antonio Badile, to be taught painting. He impr[illegible] rapidly, and very early in life enjoyed an extensive and profitable patronage.

While yet young he visited Venice, where he was commissioned to execute some paintings in the church and sacristy of St. Sebastian. The pictures excited universal admiration, from the originality of the style and the vivacity of the design. Commissions for oil paintings poured in upon him, and a portion of the walls of the ducal palace was al[illegible] to him for embellishment. From this time his fame [illegible] wealth increased rapidly.

He subsequently went to Rome; and in the course of his life visited numerous towns of his native country, in which he left behind him many lasting memorials. He was so well satisfied with his honours and emoluments at home, that he declined accepting the invitation of Philip II. to visit Spain, and contribute some works to the Escurial. He lived a life of uninterrupted labour and success, and died at Venice in the year 1588, leaving great wealth to his two sons, Gabriele and Carlo, who were also his pupils. They did not, however, attain their father's celebrity; one died young; the other abandoned painting for mercantile pursuits. Paolo had a brother, Benedetto Cagliari, who was a sculptor.

Paolo Veronese ranks among the greatest masters of the art, especially as a colourist. His colouring is less true to nature than Titian's, and less glowing in the tints; but it is rich and brilliant, and abounds in variety and pleasing contrasts. His style is florid and ornate, his invention easy, and fertile, and his execution characterized by a masterly facility. His principal works are at Venice, but his productions are to be met with in most collections.

CAGLIOSTRO, ALEXANDER, commonly called COUNT [illegible] one of the most impudent and successful impostors of modern times. His real name was Joseph Balsamo, [illegible] he was born at Palermo on the [illegible] June, 1743. His friends destined him for the monastic profession, but during his noviciate he ran away from his convent, and thenceforward lived upon his wits and the credulity of mankind. The first exercise of his ingenuity, in a public way, was to forge tickets of admission to the theatres. He then proceeded to forge a will, and having robbed his uncle, and being accused of a murder besides, he was thrown into prison. He was liberated, again imprisoned, and again set free; but was finally obliged to fly from Sicily for cheating a goldsmith of a large sum of money under pretence of showing him a hidden treasure. He went successively to Alexandria, Rhodes, Malta, Naples, Rome, and Venice, at one of which places he married a woman whose great beauty and profound immorality were very useful to him.

Quitting Italy this couple visited Holstein, where Cagliostro professed alchemy, and thence they went to Russia, Poland, &c. In 1780 they fixed themselves at Strasburg, where the *soi-disant* count practised as a physician, and pretended to the art of making old women young. As his handsome wife, who was only twenty, vowed she was sixty, and had a son, a veteran captain in the Dutch service, they for a time obtained a good deal of practice among the old women of Strasburg. Thence they went to Paris, where Cagliostro exercised the profitable profession of Egyptian free-masonry (as he called it), and pretended to show people the ghost of any of their departed friends. In 1785 he was deeply implicated with the Cardinal Duke de Rohan in the notorious affair of the diamond necklace in which the name and fame of Marie Antoinette, the unfortunate queen of France, were committed. Cagliostro was, in consequence, shut up for nine months in the Bastille, and on his expulsion from France he went to England, where, during a stay of two years, he found no lack of credulity. What took him again to Rome we know not, but in December, 1789, he was arrested in that city, imprisoned in the castle of Sant' Angelo, and after a long trial condemned to death for being—a *freemason*. (See *Process*, &c., published at Rome—a very curious document). His severe sentence was commuted for perpetual imprisonment, and he was transferred to the fortress of San Leo, where he died in 1795. His wife was also arrested, and condemned to pass her life in a convent.

CAGNO'LI, ANTO'NIO, born at Zante, September 29, 1743. He was attached to the Venetian embassy at Paris, and formed a taste for astronomy and an intimacy with Lalande. He built an observatory in the Rue Richelieu, and continued to make it useful till 1786, when he went to [illegible], where he built another. This last was damaged by [illegible] cannon-shot in 1797, but the owner was indemnified by General Bonaparte, who removed him to Modena. He was afterwards president of the Italian Society, and died at Verona about 1816. (We have found no further materials for his life: see Lalande, *Bibliog. Astron.* p. 599.)

Cagnoli wrote a work on trigonometry, first published at Verona in Italian (1786), and translated into French by M. Chompré. The second edition of the translation bears [illegible] 1808. Besides this he wrote various astronomical [illegible] and papers, mostly in the memoirs of the Italian [illegible]ciety, which should be consulted from the beginning to find them. The title of these memoirs is 'Memorie di Matematica e Fisica della Società Italiana, Modena,' quarto.

Cagnoli's trigonometry is one of those invaluable works which bring up the state of a science completely to the time at which it is written, and furnish those who want the means of application with varied stores of methods. Elementary writers on the practical parts of mathematics are among the last to adapt their rules to the actual state of science, unless somebody, who is well versed in the theory, performs the service which Cagnoli did for trigonometry. The consequence has been, that works on that su[illegible] assumed a better form, and the constant reference [illegible] been made to Cagnoli's treatise is the test of the [illegible] with which it has been used. The late Professor [illegible]oodhouse, whose treatise on trigonometry has powerfully contributed to foster a taste for analysis in this country, seems, on a smaller scale, to have taken Cagnoli for his model. The work we speak of is a quarto of 500 pages (in the French translation, the second edition of which is augmented by the author's communications), and treats very largely of the applications of trigonometry to astronomy and geodesy.

CAHORS, a city in the south of France, capital of the department of Lot (population in 1832, 283,827), situated on the right bank of the river Lot, in a small peninsula formed by a bend in its course; 370 miles S. by W. of Paris, through Orléans, Châteauroux, and Limoges; in 44° 27′ N. lat., and 1° 26′ or 1° 27′ E. long.

Cahors is a very antient place. Its name is variously written in the Greek and Latin authors. Ptolemy calls it *Δουήωνα, Dueona*; in the Theodosian table it is *Bibona*; but Ausonius is considered by M. D'Anville to have given the true orthography—*Divona*, a word in the Celtic language denoting a fountain sacred to the gods. It was the capital of the Cadurci; and towards the close of the Roman dominion in Gaul assumed, according to the nomenclature then introduced, the name of the tribe to which it belonged; whence come the modern name of the town, Cahors, and that of the province, Querci, of which it was for many centuries the capital. On the downfall of the Roman empire it came successively into the hands of Goths and Franks; was afterwards subject to the Counts of Toulouse, then to its own bishop; was taken by the English during their wars in France, and retaken from them; and carried by assault and pillaged in 1580, after a gallant resistance, by Henry IV., while as yet only king of Navarre and head of the Protestant party.

The town is situated partly on a rocky eminence, and has steep, narrow, crooked streets. The houses in what is called the upper town are commonly built with terraces commanding a wide prospect. There are few remarkable buildings: the cathedral is supposed to be the remains of an antient temple, with the addition of a portico and other parts of modern date; the seminary for the priesthood is a fine and large building; the bishop's residence presents no point of interest. There are some Roman remains, the ruins of a theatre, and an aqueduct, and a monument to M. Lucterius, erected in the reign of Augustus Cæsar. There are two antient bridges at Cahors, one on the W. side of the town, called Le Pont de Valendus, defended by some antient fortifications; and another called Le Pont Notre Dame, so much decayed as to be impassable for carriages. We presume this to be the bridge on the S. of the town which in the large map of France by Messrs. Maraldi and Cassini is called Le Pont Vieux; the same map marks a third bridge, communicating with the Faubourg St. George on the other side of the river, E. of the town, called Le Pont Neuf, the name of which indicates a more modern origin. The ramparts form a public promenade; it is probably on a part of this called Le Fossé that a monument was erected in 1820 to the memory of Fénélon.

The population of Cahors in 1832 was 10,818 for the town, or 12,050 for the whole commune. The chief manufactures are woollen cloth, leather, and paper. The neighbourhood yields wheat and oats of good quality, but not sufficient for the consumption of the inhabitants; flax, hemp, and especially wine. The wine of the neighbourhood of Cahors combines deep colour with good flavour and strength; a great quantity is sent to Paris.

The town has a seminary for the priesthood, a *collège* or high school, a library, a museum of natural history, and a theatre. Pope John XXII., a native of the town, founded here in 1321 a university, which continued to exist in the reign of Louis XV. Clement Marot, a poet of the sixteenth century, was born here.

The arrondissement of Cahors, one of the three into which the department is divided, contained in 1832 a population of 116,336. Cahors is the seat of a bishoprick, erected in A.D. 257, and now comprehending the department. The bishop is a suffragan of the archbishop of Alby.

CAICOS ISLANDS, one of the groups comprehended under the general name of Bahamas. They lie between 21° and 22° N. lat., and between 71° and 73° W. long., and, as is the case with all the groups belonging to the Bahama islands, on the E. and N. [illegible] a bank facing the Atlantic Ocean: the bank extends on the W. of them towards the West Indian Islands. When seen from the E. they appear [illegible] low rocks; they consist of corals or madrepores, which [illegible] covered with a thin layer of sand, intermixed with shells. [illegible]wards the W. they sink lower, till their beach mixes with the moving sands of the bank. They are fertile, and produce a little cotton and provisions: the inhabitants do not exceed 1000. The Caicos are six in number, besides some uninhabited rocks; [illegible] Caicos, Providenciales, N. Caicos, Great Caicos, E. Caicos, and East Harbour. There is anchorage near some of them; the best is at East Harbour.

GAIMACAN, a Turkish name which corresponds to our lieutenant, or rather lieutenant governor. The caimacan of Constantinople is the lieutenant of the grand vizier, and is governor of the city. It is an office of importance, and the person who fills it is generally styled pacha. (La Croix, *Mémoires sur l'Empire Ottoman.*) The pachas or governors of provinces have also their caimacans or lieutenants, who often act as governors of the principal towns.

CAIMAN. [CROCODILE]

ÇA' IRA', literally 'It shall go on,' meaning that the revolution must proceed. This was the beginning and the burden of a song made by the more violent revolutionists about Paris, 1789 or 1790. The song went on denouncing death against the aristocrats, who were to be disposed of by being hung 'à la lanterne' (on the lamp-posts), which was actually done in several instances. When the wholesale massacres began in August and September, 1792, the 'Çà irà' was the favourite song by which the murderers encouraged each other in their work of destruction. The tune was quick and hurried, and calculated to keep up popular frenzy. As a composition, the 'Çà irà' was very inferior both in the words and the music to the 'Allons, enfans de la patrie' (the Marsellois Hymn), which was a lofty and heart-stirring appeal to all patriots for the defence of their country when attacked by the foreign powers. After the period of terror was over, the 'Çà irà' became disused, and at last was forbidden to be played under Bonaparte, as an inauspicious memento of a sanguinary epoch.

CAIRN, or CARN, a heap of stones thrown together in a conical form. Lhuyd, in his 'Additions to Camden's Britannia in Radnorshire,' asserts that in the Cambro-Britannic, *Kaern* is a primitive word, appropriated to signify such heaps of stones. Cairns and tumuli of earth were the common monuments which the antient Britons erected in honour of their great men. Which of the two kinds was to be adopted was probably determined by the circumstance of the country being stony or otherwise.

Pennant, in his 'Voyage to the Hebrides,' 1772 (4to. Lond. 1790, vol. ii. p. 208), speaking of the cairns, says, 'These immense accumulations of stones are the sepulchral protections of the heroes among the antient natives of our islands: the stone chests, the repositories of the urns and ashes, are lodged in the earth beneath; sometimes one, sometimes more, are found thus deposited; and I have one instance of as many as seventeen of these stone chests being discovered under the same *cairn*. The learned have assigned other causes for these heaps of stones; have supposed them to have been, in times of inauguration, the places where the chieftain-elect stood to show himself to the best advantage to the people; or the place from whence judgment was pronounced; or to have been erected on the roadside in honour of Mercury; or to have been formed in memory of some solemn compact. (See Rowland's *Mona Antiqua*, p. 50; Borlase's *Antiq. of Cornwall*, p. 209.) These might have been the reasons, in some instances, where the evidences of stone chests and urns are wanting; but those generally are found to overthrow all other systems.

'These piles,' Pennant adds, 'may be justly supposed to have been proportioned in size to the rank of the person, or to his popularity: the people of a whole district assembled to show their respect to the deceased, and by an active honouring of his memory soon accumulated heaps equal to those that astonish us at this time. But these honours were not merely those of the day; as long as the memory of the deceased existed, not a passenger went by without adding a stone to the heap: they supposed it would be an honour to the dead, and acceptable to his *manes*. To this moment,' he continues, 'there is a proverbial expression among the highlanders allusive to the old practice: a suppliant will tell his patron, *Curri mi cloch er do charne* (I will add a stone to your *cairn*), meaning when you are no more I will do all possible honour to your memory.'

Jamieson, in his Etymological Dictionary, says, 'In Angus, where any person has been murdered, a cairn is erected on the spot.'

Pausanias (10, 5. 4) mentions monuments of collected stones, and in another (8, 13. 3) he speaks of similar monuments near enus, in Arcadia, for persons who had fallen in ba

CAIRNGORUM, or NGORM MOUNTAINS, are situated in the Highlands of Scotland, to the N. of the central Grampians, between 57° 10′ and 57° [illegible] N. lat., and 3° and 3° 20′ W. long. They consist of enormous masses of rock, overtopped by several heights, and enclosing the lake of Avon. This lake, which is at an elevation of 1650 feet above the sea, is surrounded by [illegible] and frightful precipices. The mountains Cairngorm and Ben-bainac rise almost perpendicularly from its N. and W. edges, and the vast masses of Ben Muc D'hu and of Bain-main overhang its southern shores, so that for several months in the winter the sun never shines on the surface of the lak enormous rocks are without vegetation. No living creature, is seen on their precipitous sides. The river Avon issues from the lake in a large stream, and flows through a deep, dark, and uninhabited glen. Sixteen miles from the lake the first habitations of men occur. These enormous masses are considered as constituting the highest land in Great Britain. Ben Muc D'hu, the highest of the summits, rises 4389 feet above the level of the sea, and is therefore higher than Ben Nevis. But there are still some doubts about their respective height. (Sir Thomas Dick Lauder's *Account of the Great Floods;* and M'Culloch, *Highlands and Western Islands.*)

CAIRO. [KAHIRA.]

CAISSON. [COFFER-DAM.]

CAIUS. [GAIUS]

CAIUS,* Dr. JOHN, was born at Norwich, October 6, 1510. After receiving the first rudiments of learning in that city, he was sent to Gonville Hall, in the University of Cambridge: he took the degrees of B.A. and M.A. at the usual times, and was chosen Fellow of his college in 1533. His literary labours began at the age of twenty, by a translation into English of St. Chrysostom 'De Modo orandi Deum.' This was followed by a translation of Erasmus 'De verâ Theologiâ,' which, he says, 'I dyd geue to maister Augustine Stiwarde, alderman of Norwiche, not in the ful as the author made it, but abbreuiate for his only purpose to whom I sent it, leuying out many subtile things, made rather for great and learned diuines than for others.' His third production was a translation of Erasmus's paraphrase upon the epistle of St. Jude. His excuse for writing in English is curious enough: 'These I did in Englishe the rather because at that tyme men ware not so geuen all to Englishe, but that they dyd fauoure and mayteine good learning conteined in tongues and sciences, and did also study and apply diligently the same themselves. Therfore I thought no hurte done. Sence that time diuerse other thynges I haue written, but with entente neuer more to write in the Englishe tongue, partly because the commoditie of that which is so written passeth not the compasse of Englande, but remaineth enclosed within the seas,' &c. (*A Counseill against the Sweat*, fol. 4.)

It was probably soon after this that he travelled in where he remained several years. He studied med Padua under Baptista Montanus and Vesalius, and took the degree of Doctor at Bologna. In 1542 he gave lectures at Padua on the Greek text of Aristotle, in conjunction with Realdus Columbus, the salary being paid by some noble Venetians. The following year he made the tour of Italy, visiting the most celebrated libraries, and collating MSS. in order to improve the text of Galen and Celsus. At Pisa he attended the medical lectures of Matthæus Curtius; and then returned home through France and Germany. On his return he was incorporated Doctor of Physic at Cambridge, and practised with great distinction at Shrewsbury and Norwich. By the appointment of Henry VIII. he read lectures on anatomy to the Company of Surgeons; but he does not appear to have settled in London till a later period, when he was made physician to Edward VI. He retained his appointment under Mary and Elizabeth.

In 1547 Dr. Caius became a Fellow of the College of Physicians, and was ever a strenuous upholder of its right and interests. A difference having arisen between the physicians and surgeons in the reign of Elizabeth as to whether the latter might administer internal remedies in cases where their manual assistance was required, Dr. Caius, then president, was summoned to appear before the lord mayor and others of [illegible] queen's delegates. On this occasion he pleaded the physicians' cause so ably, that although the surgeons were supported by the bishop of London and the Master of the Rolls, it was unanimously agreed by the commissioners that it [illegible] unlawful [illegible] the surgeons to practise medically in such cases. Dr. Caius was president of the College of Physicians for more than seven years. He left behind him a book of the college annals, from 1555 to 1572, written with his own hand, in a clear Latin style. Having obtained permission from Queen Mary, with whom he was much in favour, to advance Gonville Hall into a college, which still bears his name, he accepted the Mastership of the college, and passed the last years of his life in it. That his retirement was not owing to any gloomy distaste to the world but to a fondness for learned leisure, appears from the numerous literary labours in which he was engaged to the last moments of his life. Before his death he was reduced to a state of great weakness; and it appears from the following quaint passage in Dr. Mouffet's 'Health's Improvement, or Rules concerning Food,' that he attempted to sustain his flagging powers by reverting to the food of infancy. 'What made Dr. Caius in his last sickness so peevish and so full of frets at Cambridge, when he sucked one woman (whom I spare to name) froward of conditions and of bad diet; and, contrariwise, so quiet and well when he sucked another of contrary dispositions? Verily, the diversity of their milks and conditions, which being contrary one to the other, wrought also in him that sucked them contrary effects.'

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* His real name was Kaye, or Key, which he latinised to Caius. It is not a little singular that Shakspeare should have given the name of C foolish French doctor in the 'Merry Wives of Windsor.' Farmer's that Shakspeare was little acquainted with literary history, and, from his unusual name, supposed Caius to have been a foreign [illegible] unsatisfactory. It did not require any acquaintance with literary history to know that Caius had been Court-physician in the times of preceding [illegible].

Dr. Caius died July 29, 1573, in the sixty-third year of his age, and was buried in the chapel of his own college. His monument bears the pithy inscription 'Fui Caius.'

The most interesting of the works of Dr. Caius is his treatise on the sweating sickness. The original edition is a small black-letter and extremely scarce duodecimo of 39 folios, 'imprinted at London, by Richard Grafton, printer to the kynges maiestie. Anno Do. 1552.' It is entitled 'A boke, or counseill against the disease commonly called the sweate, or sweatyng sicknesse. Made by Jhon Caius, doctour in phisicke.' This was intended for the public in general; but in 1556 the author published it in an enlarged form, and in the Latin language, under the title 'De Ephemerâ Britannicâ.' The epidemic described by Caius was that of 1551, the fifth and last of the kind. It was an intense fever, of which the crisis consisted in a profuse perspiration. The death of the patient often followed two or three hours after this symptom, but if he survived the first attack of the disease twenty-four hours, he was safe.

The works of Dr. Caius are exceedingly numerous, and display his talents as a critic, a linguist, a naturalist, and an antiquary, as well as a physician. The original works of Dr. Caius consist of treatises, 'De Medendi Methodo,' 'De Ephemerâ Britannicâ,' 'De Ephemerâ Britannicâ ad Populum Britannicum,' 'De Antiquitate Cantabrig. Academiæ,' 'De Historiâ Cantabrig. Academiæ,' 'De Canibus Britannicis,' 'De Rariorum Animalium atque Stirpium Historiâ,' 'De Symphoniâ Vocum Britannicarum,' 'De Thermis Britannicis,' 'De libris Galeni qui non extant,' 'De Antiquis Britanniæ Urbibus,' 'De Libris propriis,' 'De Pronunciatione Græcæ et Latinæ Linguæ cum Scriptione Novâ,' 'De Annalibus Collegii Medicinæ Lond.,' 'De Annalibus Collegii Gonevilli et Caii,' 'Compendium Erasmi Libri de verâ Theologiâ.' He also edited, translated, and commented upon, many pieces of Hippocrates, Galen, and others.

Several of his treatises were re-printed, under the superintendence of Dr. Jebb, Lond. 1729, 8vo.; and his treatise 'De Ephemerâ Britannicâ' has been lately edited by Dr. J. F. C. Hecker, Berolini, 1833, 12mo.

In the present age, when the writings of the founders of the healing art are rarely studied, it is difficult to sympathize with the deep veneration of Caius for their opinions; yet it should never be forgotten that it is to such as he that we are indebted for that general diffusion of medical knowledge which has rendered the best parts of the practice of Hippocrates and Galen familiar to those who have never [illegible] a line of their works; and that the great founder of Caius College was not only an able physician himself, but paved the way for the Heberdens, the Cullens, and the Hunters.

(Hutchinson's *Biographia Medica;* Aikin's *Biogra*[illegible] *Memoirs of Medicine in Great Britain; Der* [illegible]*che Schweiss,* von Dr. J. F. C. Hecker.)

CAIUS COLLEGE, Cambridge, or more properly Gonville and Caius College, was founded in 1348 by Edmund de Gonvill, rector of Terrington and Bushworth in Norfolk, who at the instance of Walter de Manny, one of the founders of the Order of the Garter, obtained a license for that purpose from Edward III.

Gonvill laid the foundation of his college on the spot (as Speed tells us) where the orchard of Corpus Christi College is now standing (1605), and dedicated it to the honour of the Annunciation of the Blessed Virgin; but dying before his intentions were fulfilled, he left a large sum of money to William Bateman, Bishop of Norwich, in trust for the completion of his building, and for the support of a master, four fellows, and twenty scholars. Bishop Bateman removed from the spot selected by Gonvill, and having purchased houses 'near to his own hall,' erected on their site the new building which he called Gonvill Hall; and he increased its revenues by his own bounty. Mr. Dyer, on the authority of Dr. Caius, says that the bishop did not build, but confirmed the hall.

Various other benefactors added to its endowments, especially Dr. Perse, who founded six fellowships, and gave to the college the right of appointing the master of the free school, which he had established at Cambridge. Thus in 1557 there were, according to Speed, a master, twenty-two fellows, 'one conduct,' and forty-five scholars, 'with officers and servants of the foundation, and other students.'

In 1557 Dr. John Caius, having rebuilt a large part of the college, erected the chapel, and endowed three additional fellowships and twenty scholarships, obtained from Philip and Mary leave to be a co-founder, and to change the name from Gonvill Hall to Gonville and Caius College.

The present establishment is as follows:—A master; twelve senior fellows, of whom three are of the original foundation, three of Dr. Caius's foundation, two of whom must be physicians, and all Norfolk men, and six of various founders, five of whom must be priests, and two of these must belong to the diocese of Norwich; eight junior fellows, one of whom must be a priest of the Norwich diocese—out of these the senior fellows are elected; six fellows of Dr. Perse's foundation, preference being given to scholars of Perse's Grammar School; three fellows of Mr. Wortley's foundation, one confined to part of Devon and one to Norfolk; making in all twenty-nine fellows: twenty-nine scholars, the aggregate revenue of whom is 1035*l.*; two of the scholarships are confined to students from Harrow School, and one to a student in chemistry. There are eight exhibitions, amounting together to 120*l.* per annum. Among the celebrated men educated in this college, may be enumerated Dr. Caius, the co-founder, Sir Thomas Gresham, Bishop Jeremy Taylor, and Lord Chancellor Thurlow. The number of members resident and non-resident in 1835, according to the Cambridge Calendar, was 272. The annual value of the church livings in the patronage of this society amounts, according to the Ecclesiastical Returns 1835), to between 8000*l.* and 9000*l.* (Speed's *Chronicle;* Dyer's *History of Cambridge;* and the *Cambridge Calendar of* 1835.)

CAITHNESS. This county occupies the north-eastern extremity of Scotland. It is bounded on the west by Sutherlandshire; on every other side it is washed by the ocean. The coast-line presents numerous indentations or bays. On the north, where it is separated from the Orkneys by the Pentland Frith, the projections of the coast form two bold precipitous headlands; the one on the north-east, called Duncansby Head (58° 37′ N. lat., 3° 1′ W. long.), the other on the N.W., called Dunnet Head, 58° 40′ N. lat., and the most northern point of Great Britain. Nearly in the centre of the strait or frith, between these two points, lies the Isle of Stroma, forming a portion of the shire. The mountain-range which separates the table-land of Sutherland from the plains of Caithness does not rise to a great elevation in its course from north to south, and within these limits it does not exhibit any remarkable summit. But it attains a mountain character in the southern parts of Caithness, where it turns to the east, forming two distinct and high ridges, of which the northern contains the Maiden Paps, with the high summit of M[illegible]phein, rising about 2334 feet above the sea; and the southern terminates on the east coast with the Ord of Caithness, which advances into the sea.

The plain of Caithness, which lies between the ridge of the Maiden Paps, the Pentland Frith, and the mountains that bound the county of Caithness on the west, com[illegible] about four-fifths of the county; but it is not a perfect level. Where it borders on the mountains to the south it contains many small hills, which form nearly a continuous chain, terminating in the cape of Clyth Ness. North of this range the country extends in wide levels, covered with moors, and slopes gradually to the beds of the rivers. A few insulated hills are of moderate elevation. Some of the moors may be from 200 to 300 feet above the sea, and are not cultivated, but many parts of them afford pasture. Agriculture is confined to the large tracts of level land along the water-courses, and to the slopes of the elevated plains. These elevated moorlands sink lower towards the north-east, and terminate in a low plain between Sinclair Bay on the east coast, and Dunnet Bay on the north-west. From the innermost part of Dunnet Bay there extends a very low tract of land, covered with heath and rough grass, and about two miles wide, in a straight line to Keiss Castle on Sinclair Bay. It is hardly more than 30 feet above high-water mark in any part. North of this tract the peninsula enclosed between Sinclair and Dunnet Bays runs to the Pentland Frith, and terminates in Duncansby Head and Dunnet Head. The greater and more elevated part, which may be 100 feet above the sea, has a light sandy soil; but though it was long neglected it now contains a considerable amount of land under cultivation, which is daily and rapidly improving.

The extreme length of Caithness, by a line drawn from its south-west point to Duncansby Head, is 43 miles: the greatest breadth from east to west is about 30 miles. The county contains nine parishes, and a portion of a tenth, the remaining portion being in Sutherland.

Parishes.	Population in 1831.
Bower	1,615
Canisbay	2,364
Dunnet	1,906
Halkirk	2,847
Latherton	7,020
Olrick	1,146
Reay (part of)	1,868
Thurso, including the town	4,679
Wattin	1,234
Wick, including the burgh	9,850
Total population	34,529

The population of the shire in 1801 was 22,609; in 1811, 23,419; in 1821, 30,238. Of the population under the census of 1831 there were 16,359 males, 18,170 females. The number of families was 6904, of which 3580 were chiefly employed in agriculture; 1487 in trade, manufactures, and handicraft; and 1837 were not included in these two classes. In the specification of males more than twenty years of age engaged in handicraft, &c., out of 2257 so employed there were 309 carpenters, 245 masons and wallers, 101 blacksmiths, 87 boat-builders, 69 fish-curers, 43 millers, 151 tailors, 268 shoe-makers, 88 publicans or inn-keepers, and [illegible]3 small shop-keepers.

The chief, and indeed the only town, with the exception of Thurso, is Wick, on the bay of Wick, on the east coast. It has increased considerably of late years: and Pultney town, which is situated on the opposite side of the harbour, and connected with Wick by a bridge, has been entirely built within the present century, on land held under lease by the British Fishery Society. The herring-fishery has given life and animation to the north-east coast of Scotland, where formerly there existed but little stimulus to industry. In Wick, which has a good harbour, and forms the greatest station in the north for the herring fishery, there are, during the summer months, usually from 1500 to 2000 boats stationed. Grain, wool, and the proceeds of the fishery are the principal exports, and furnish cargoes to a number of trading vessels; but there is no manufacture of any importance. Wick, along with Kirkwall, Dornoch, Dingwall, Tain, and Cromarty, returns one member to parliament.

Thurso is on the N. coast, about 20 miles N.W. of Wick. It lies in a valley or bay formed by Holburn Head and Dunnet Head. A stream, called Thurso Water, enters the bay close to the town. There is an anchorage, called Scrabster Roads, under Holburn Head; the coast to the west of this promontory is wild and rugged, the rocks being rent, and hollowed by the waves into caverns. A mass of rock, called the Clett, the resort of innumerable sea-fowl, is separated from the main-land near Thurso by a chasm. The family mansion of the late Sir John Sinclair is at Thurso; it was formerly a seat of the earls of Caithness; at a short distance from it he erected a low circular building, surmounted by a sort of embattled parapet, which he intended should mark the grave of Harold, earl of Caithness, who was killed about this spot many centuries ago. It is a conspicuous object in a country comparatively bare and desolate. The parish of Thurso, owing to Sir John Sinclair's exertions, is the most improved district in Caithness.

The direct distance between Dunnet Head and Duncansby Head, the two points of the northern extremity of the peninsula, is about 13 miles. The small island of Stroma, which is about a mile in length, and half a mile in breadth, lies about 3 miles off the main-land. The navigation of the Pentland Frith is somewhat dangerous from the strength of the currents, and breakers or reefs. On the north side of Stroma there is a small vortex or whirlpool, named Swalchie, and nearer the main-land there are breakers, called the Merry Men of Mey, which are probably produced by a current setting strongly on a hidden reef. The tall white steeple of Canisbay, near Duncansby Head, serves as a land-mark; a light-house has been recently erected on Dunnet Head. The Stalks of Duncansby are two insulated columns of freestone, detached from the cliff, of which they originally formed a part; they are inhabited during the summer by thousands of aquatic birds. Duncansby Head, which rises to a considerable height, is characterized by Macculloch as being 'red, square, and ugly.' Near it is the ferry to the Orkneys, a village consisting of a few houses, and a place of entertainment, called the Houna Inn. What is termed John O'Groat's House is a piece of green turf on the east side of Duncansby Head, on which it is possible a house may have stood, but there has been no trace of one for many years.

The general appearance of Caithness is far from being attractive, but it hardly deserves the unqualified observation of Macculloch, who says, 'an uglier country than Caithness, from one end to the other, would not easily be found.' The cold winds which, during a great part of the year, sweep across the country from the north-east and north-west, stunt all vegetation; trees will not rise higher than the shelter which is afforded to them. But considerable improvements have been effected latterly; new roads have been formed; and should the herring-fishery on the east coast prove a permanent source of employment, it will tend to draw out the resources of the country.

Caithness returns one member to Parliament.

The county gives the title of earl to the family of Sinclair, which is descended from the St. Clairs of France. The earl of Caithness is lord-lieutenant of the county.

(*Physical and Political Geography of Great Britain* of the Society for the Diffusion of Useful Knowledge, Part IV.; Macculloch's *Highlands*, vol. ii.; *Summer Rambles in the North Highlands; Boundary Reports, Scotland; Population Returns*.)

CAJEPUT. [MELALEUCA.]

CALABAR, OLD, a river of Africa, which falls into the Bight of Biafra, about 52 miles N. by W. of Fernando Po. It is the largest river on this coast, and forms an æstuary 9 miles wide, which is full of shallows and sand-banks. Although so far to the eastward of that branch of the Quorra which has been traced to the sea, it app[illegible] be one of the outlets of that great river, which it joins above Eboe town.

The principal place on the river is called Duke's or Ephraim Town, which stands on the eastern bank, about [illegible]0 miles from the entrance: slave-vessels and traders generally anchor off this place. This town is on elevated ground; the houses are mostly of clay, like those of the Eboe people, and are built without regularity along the banks of the river, which is here about a third of a mile wide. Although there is no established custom-house for the payment of duties, the chief is careful to exact a tax under the name of a present, without which no vessel is allowed to commence traffic. Twelve miles above Duke Town is another large village, called Creek Town.

The river is very winding, and the shores are low and swampy; the country is overrun with bushes, principally of the mangrove, and there are few cleared spots on the banks of the river. The right bank is much intersected by creeks, through which the natives assert they can in their canoes communicate with all the rivers that fall into the Gulf of Guinea between this and the Benin, forming the great delta of the Quorra.* To the eastward of the Calabar is the high land of Camaroons. The canoes of the natives resemble those of [illegible]boe people, but are not so large. The river abounds in alligators, from 12 to 14 feet long: there are few fish. The water is not considered good, owing to the quantity of decayed animal and vegetable matter which it contains. It is high water at the entrance of the river at six o'clock; the rise is about six feet.

CALABAR, NEW, another river to the westward of the Old, and 52 miles east of Cape Formosa, empties itself into the same estuary with the Bonny. It is a wide but sluggish stream, with a bar across the entrance, which renders it accessible only for vessels drawing about 12 feet. Five miles up however there is an average depth of 30 feet. By the Portuguese it was called Rio Real, and it is evidently one of the branches of the Quorra. The town of New Calabar stands on an island formed by two branches of the river, and contains about 300 houses.

The commerce of these two rivers, as well as the others along this coast, consists in slaves, ivory, and palm-oil, which are bartered for Manchester goods, hardware, gum, and powder. Salt, which is made by evaporation from sea-water in large brass pans, is also an article of great trade with the interior.

The district to which the name of Calabar is given is very undefined and variable, as the chiefs are generally at war with each other, and overrun the neighbouring territories whenever they feel themselves sufficiently powerful. All this part of the African coast is low and swampy for 40 or 50 miles inland from the sea-coast, with few places fit for cultivation, though on these spots the soil yields plentifully not only yams, which are the chief food of the natives, but also the sugar-cane, and other tropical productions. Polygamy is customary among the natives, and human sacrifices are often made to propitiate good and evil spirits at funerals, and likewise periodically to the Spirit of the River, when the victims are carried out to the bar, and there thrown overboard to be devoured by the sharks. Every eighth day is a holiday, and is passed by both sexes in drinking palm-wine in a state of fermentation, till they become quite intoxicated.

CALABASH, a name given in the West Indies to the fruit of the tree called Crescentia Cujete by botanists.

CALA'BRIA, the S. part of the kingdom of Naples, extending from the borders of Basilicata, which are marked by the river Trecchina, on the W. or Mediterranean side, and by the small river of Roseto on the E. side, about 40 S. lat, to Cape Spartivento at the extremity of the Italian peninsula, 37' 56' N. lat., a length of about 160 miles in a somewhat curved line. The country consists of two peninsulas of very nearly equal length, joined by a narrow neck only fourteen miles broad, between the Gulf of Squillace and Sant' Eufemia. The greatest breadth of the N. peninsula, from [illegible] to sea, is about sixty miles, and that of the S. peninsula is in few places above thirty. The area of Calabria is computed by Neigebaur at 320½ German square miles, or about 7050 English square miles. Swinburne states the surface at 3,507,000 Neapolitan moggia, a land measure, about 7-8ths of an English acre. The population is stated by Neigebaur at 852,000: in Swinburne's time, sixty years ago, it was reckoned at 775,700.

The Apennines run through the whole length of Cala[illegible]orming large and irregular masses, with numerous [illegible] towards both seas, and occupying the greater part of the surface. In the N. the main ridge runs close to the Mediterranean coast as far as the river Savuto, S. of Cosenza, where it spreads eastward across the breadth of the peninsula, forming a mountain region of about thirty-five miles in length from W. to E., and twenty-five in breadth from N. to S. This region, which is called La Sila, is partly covered with forests and occupied by rich pastures, where the cattle and flocks are led from the lowlands during the summer. In these mountains the rivers Crati, Neto, Savuto, and many smaller streams have their rise. Near Nicastro, and between the sources of the Lamato and Corace, the ridge becomes narrow as it passes through the isthmus above-mentioned; it then runs nearer to the E. coast, till towards the S. extremity of the peninsula it forms another large mass called Aspromonte, which fills nearly the whole width of the country above Reggio. The highest summits of Calabria do not exceed 5000 feet, except Monte Pollino on the borders of Basilicata, which rises to 7000 feet. The Calabrian Apennines are chiefly of limestone, but there are also tracts occupied by primitive rocks. A granitic ridge passes through the country, and rises to the height of several thousand [illegible] it appears chiefly at the S. end of the peninsula. Between the various masses and offsets are some extensive valleys along the banks of the principal rivers, which terminate in plains near the sea. The valleys of Cosenza and Monteleone, and the plain of Gioia, are the most extensive and fertile. The olive, the vine, the mulberry, and the orange and lemon tree grow luxuriantly. Calabria produces a variety of good wines, some of which keep very well for years. Silk and oil are the staple productions of the country. Manna is gathered in considerable quantity in several districts. The cotton tree is also cultivated, and the sugar cane has been tried and found to succeed.

Calabria is divided, for the purposes of administration, into three intendenze or provinces:—1. Calabria Citra, which extends from the borders of Basilicata to the river Savuto on the Mediterranean side, and the Fiumenica S. of Cariati on the other. It includes four districts: Cosenza, Castrovillari Rossano, and Paola. Towns: Cosenza, the capital of the province, and an archbishop's see, built on a hill at the confluence of the Crati and Busento, in a fine valley ornamented with country houses and hamlets, has a royal lyceum, population 9000; Acri, in the valley of the Mucone, another affluent of the Crati, pop. 7800; S. Giovanni à Fiore, in the valley of the Neto, rich in pasture, pop. 6200; Rossano, in a fruitful district near the sea, pop. 7000; Corigliano, a large town surrounded by olive and orange plantations, with a castle, and a fine aqueduct, pop. 6000; Cassano, in a romantic situation, with a handsome mansion of the Serra family, the owners of large estates in this district, and with cotton and silk manufactures, pop. 6000; Castrovillari, in the valley of the Coscile or Sibari, pop. 6000; Paola, a neat town of 5000 inhabitants, chiefly seafaring people, in the district of the same name, which is a narrow strip of land cultivated with great industry, and lying on the western slope of the Apennines down to the Mediterranean Sea, fifty-six miles long, with about forty small towns or villages along the coast; Amantea, a fortified town, pop. 3000; Cetraro and Diamante, on the same coast, where much wine is shipped; and Guardia, called also Guardia Lombarda, formerly a colony of the Valdenses from Piedmont, who were cruelly persecuted and extirpated in the sixteenth century. 2 Calabria Ultra II. extends S of Calabria Citra, and as far as the river Mesima on the W. coast, and to a few miles N. of Cape Stilo on the E. It contains four districts: Catanzaro, Cotrone, Nicastro, and Monteleone. Towns: Catanzaro, the capital of the province, in the valley of the Corace, a bishop's see, and the residence of the Upper Civil Court for all Calabria, has a secondary school or gymnasium, silk manufactories, and 12,000 inhabitants: Cotrone, the ancient Croton, a fortified town, with a small harbour, the only one on the E. coast of Calabria, pop. 4000. Near Cotrone is the Capo della Colonna, the antient Lacinium Promontorium, with a single Doric column twenty-six feet high, the remains of the Temple of Juno: Squillace, the antient Scyllacium, a decayed town, with 2000 inhabitants: Nicastro, a straggling town, near the W. coast, 5000 inhabitants; Maida, a small town on the Gulf of St. Eufemia, known for the battle between the English and the French in 1806; Monteleone, a large wealthy town in a fertile district called 'Il Piano di Monteleone,' gives the title of duke to a Neapolitan family, trades in silk and oil, has a royal college or lyceum, pop. 6000; Pizzo, where Joachim Murat landed, and was executed in October, 1815, pop. 5000, chiefly seafaring people; Mileto, Tropea, Nicotera, &c. 3. Calabria Ultra I., the most southern part of the peninsula, includes three districts, Reggio, Gerace, and Palmi. Towns: Reggio, the capital of the province, a thriving town in a delightful situation at the foot of the Aspromonte, and on the coast opposite to Sicily, an archbishop's see, has a royal lyceum, and a pop., including the suburbs, of 20,000. The country about Reggio, which is a strip of land between the Apennines and the sea, ten miles long and about four broad, with about fifty communes or villages, and 53,000 inhabitants, is one of the most fertile spots in Europe. It produces excellent wine, oil, fruits of every sort, especially lemons and oranges, of which essences are made, silk, &c. The produce of some parts of this land is of the annual value of 300 ducats (50*l.* sterling) the moggio, which is somewhat less than the English [illegible] (Afan di Rivera, *Considerazioni sulle due Sicilie*, 183[illegible].) Bova, on a hill, near Cape Spartivento, pop. 9000. This part of the country contains many villages peopled by the descendants of Albanian and E[illegible] colonists, who settled in Calabria in the time of [illegible]

They still retain some of their original customs and dialect. Greek names are common here, such as Pentimele, Valanidi, Mala[illegible] Polistena, all of which are villages in this part of Cala[illegible] the river which flows near Polistena is called Jeropotamo. Gerace, the ancient Locri, now a bishop's see, has 6000 inhabitants. Near it are the Capo di Stilo, and the village of Pazzano, with a rich iron mine, the only one which is worked in the kingdom of Naples. Palmi, on the W. coast, a neat town with silk and woollen manufactories, and a considerable trade in oil, essences, &c., pop. 6000; Scilla, with a strong castle, and 4000 inhabitants, mostly engaged in the tunny fishery; Seminara, Bagnara, Gioja, are small towns near the same coast.

The extensive region now known by the name of Calabria, was in the Roman times chiefly occupied by the Brettii or Bruttii, whom some historians have represented as runaway slaves and outlaws, and others as a wild aboriginal race, living in the extensive forests which then extended over the greater part of the country. The E. coast was early colonized by Greeks, and became known, with the rest of the coast as far as Tarentum, by the general denomination of Megale Hellas or Magna Græcia. But the oldest name of the most southern peninsula of Calabria (that bounded on the N. by the Gulfs of Squillace and Eufemia) was Italia, a term which was afterwards extended to comprise the country as far as Tarento (Taras or Tarantum), and finally became the name of the whole peninsula of Italy. (Aristot. *Polit.* vii. 10.) The name of Calabria was given by the Greeks to quite a different country, namely, the N.E. coast of the Iapygian or Messapian peninsula, from Brundisium to Hydruntum; the Salentines occupied the S. part of the same peninsula. The name of Calabria, as applied to that part of Iapygia, continued in use under the Romans, and afterwards under the Byzantine emperors, as we find in Paulus Diaconus in the eighth century, and Luitprand of Cremona in the tenth, who both speak of Apulia and Calabria as one province, while they call the modern Calabria by the name of Bruttia, which by Constantine's division of the empire made one province with Lucania. How the name of Calabria came to be transferred to the country of the Bruttii is not clearly ascertained; but it would appear that the Byzantines having lost in the eleventh century the old Calabria, and still retaining several towns on the coast of the former Magna Græcia, transferred the name of the former province to their last remaining possessions in S. Italy The first Norman conquerors took the title of Dukes of Apulia and Calabria. Under the Angevins, the presumptive heir to the throne was styled Duke of Calabria, which custom has continued to this day. A dreadful earthquake occurred in Calabria in 1783, which devastated the S. portion, and ruined many towns. (Serrao, *De' Terremoti di Calabria*, and other accounts of that epoch.) Calabria made a determined resistance against the French, first in 1799, when the Calabrians under Cardinal Ruffo reconquered the kingdom, and afterwards in 1806-7, when they waged a partizan warfare against the invaders. They were not ultimately subdued till 1810, when General Manhes armed one part of the population against the other, and by terror and bloodshed extirpated the malcontents. (For the atrocities of that period see Lieutenant Elmhirst's *Occurrences during Six Months' Residence in Calabria Ulterior*, 1809-10; *Recollections of Calabria*, by a French Officer; and Colletta, *Storia del Reame di Napoli*.)

The Calabrians are a proud, thoughtful, and warm-hearted, fiery race; having remained for centuries secluded from the rest of the world, and in a stationary social state, they have retained much of their peculiar character. They are personally brave and faithful to their word; are generally good marksmen, and make good soldiers under proper discipline. They have the reputation of being tenacious of purpose even unto obstinacy. Their dialect is different from the Neapolitan, and more resembles the Sicilian. The crimes which in former times were frequent in Calabria were the offspring of revenge and jealousy, excited and fostered by feudal abuses, a bad administration, and a vicious judicial system. Things are now changed for the better; murders are no longer frequent; and the banditti have disappeared. The higher orders are sociable, well informed, and hospitable. Keppel Craven, who has given the latest and best account of Calabria, speaks upon the whole favourably of the people:—'Their demeanor was civil, but perfectly different from that of the natives of the other provinces of Naples: a look of independence, not unmixed with melancholy [illegible] was observable in their countenances, [illegible] her respects an expression far from unpleasant. Most of their towns are built on conical hills, which they crown to the very top; the lower houses being joined together by thick walls constitute a kind of rampart. The women wear a body with the full shirt sleeves, and a thickly plaited petticoat of coarse cloth, and on the head a cloth folded like a napkin, as in other parts of the Neapolitan and Roman states. The men wear short jackets, and close hose, generally of black cloth, leather gaiters or coarse stockings, with shoes of undrest skin tied by thongs half way up the leg, sandal fashion. Their hats are conical and high, with hardly any brim to them.' The principal deficiencies of Calabria are want of harbours along the coasts, and the malaria which prevails in most of the large valleys. By embanking the rivers and draining the marshes the atmosphere is gradually improving. The great carriage road from Naples, which has been continued to Reggio through the whole length of Calabria, with branch roads towards both seas, is another essential improvement.

CALAHORRA stands on an elevated plain, near the S. bank of the Ebro and the frontiers of Navarre, four leagues from Corella. It is the Calagurris, which in the year 682 of Rome sustained a memorable siege against Cneus Pompey, who at last took and destroyed the city, after an obstinate resistance and a most horrible famine, in which, according to Val. Maximus (vii. 6), even mothers fed upon their children, and men upon both. There remain only part of its strong walls and three towers, with its aqueducts and some other traces of antient buildings. It is now an episcopal city of the *partido* (district) of Logroño, in the province of Soria, Old Castile; and its rich surrounding territory is called, in the Spanish style, *tierra de Calahorra*. It contains near 7000 inhabitants, a foundling hospital, an asylum for poor sexagenarian labourers, four tan-houses, some distilleries, and two olive-mills, besides many flour-mills on the Cidacos, which runs close to the cathedral. When this river and the Ebro, which join their waters half a league off, overflow the fields of Calahorra, the inhabitants are cut off from all potable water, owing to the wells and fountains being on the opposite side of the first stream.

This city gave birth to Quintilian, to St. John of the Cross, the reformer of the Carmelite order, and to Peter Garcia Carrero, physician to Philip IV., Professor of Alcala, and author of the Disputationes Medicæ, Commentarii in omnes libros Galeni, and De Locis Affectis. 42° 15′ N. lat., 2° 7′ W. long.

CALAIS, a town and port of France, in the department of Pas de Calais, on the sea, 145 miles in a direct line N. or N. by W. of Paris, or 148 miles by the road through Beauvais and Abbeville, 157 miles through Clermont, Amiens, and Abbeville, 173 miles through Peronne, Arras, and St. Omer; in 50° 58′ N. lat., and 1° 51′ E. long.

Some writers have endeavoured to identify this town with the Portus Itius of Cæsar, but D'Anville considers that Witsand or Wissant between Calais and Boulogne has a better claim to be considered as the Portus Itius. Calais is chiefly known in history from the memorable siege or rather blockade of nearly a twelvemonth, which it endured from the English army under Edward III. in the year 1346-47, and from its remaining long in the possession of England. Upon its capture the French inhabitants were driven out, and English and other foreign settlers placed in the town, but after a year or two many of the French were readmitted to their former abode. Under the patronage of the English crown Calais became a thriving place, and the seat of a considerable trade in wool, which was drawn away from Middlebourg in Zealand. In 1558 it was retaken by the French after a short siege of a week, having been in the possession of the English above 200 years. It was subsequently taken by the Spaniards under the Archduke Albert, in 1596, but restored to France by the peace of Vervins, in 1598. When the archduke took the city he gave permission to the inhabitants to retire, if they thought right, to other parts of France; all did so except two families. The houses and goods were taken possession of and sold by the Spaniards. Upon the restoration of the town to France the inhabitants returned, and entered into an agreement to exclude from all magisterial offices the two families which had remained in the place, and their descendants. In 165[illegible] the inhabitants with a weak garrison repulsed the Spaniards, In 1694, 1695, and 1696, Calais was thrice bombarded by the English fleet.

The importance [illegible] interest of Calais are now mainly dependent upon it [illegible]; the great port of communication with England. [illegible] about 25 miles from Dover. The coast of England and France approach nearer (at Dungeness and Cape Grisnez), but these are the nearest ports between which communication is carried on.

The country about Calais is a complete flat, and, by the facilities for inundating it, contributes to the military strength of the place. Calais is strongly fortified. The town and citadel form a parallelogram, having one of the longer sides towards the sea. The harbour is formed by the [illegible] of the little river de Hames, and the entrance to it is between two long wooden jetties carried out from the town across the sands to beyond low-water mark. At the head of these jetties are two forts, called Fort Rouge and Fort Verd. At the commencement of one pier is Fort Risban; and a short distance W. or S.W. of the town is Fort Nieulay or Nieulet, defended by four bastions. The citadel is at the western end of the town; it is large and strong, and commands at once the town, the port, and the country around. This was not built until after the expulsion of the English; many houses were demolished to make room for it.

The streets of Calais are laid out with tolerable regularity, but are narrow; the back streets are neglected and dirty. The houses are of brick and stone, but have a mean appearance. In the centre of the town is the Grand Place, which serves as an evening promenade and as a market-place. It contains the town-hall, and, near this, the light-house, with a revolving light. Near the port is the pillar erected to commemorate the landing of Louis XVIII. in 1814. The ramparts serve as a public promenade. The church, near the S.E. corner of the town, has nothing remarkable in its exterior, but it contains a great number of altars, which give the interior rather a striking appearance. A suburb called the Lower Town extends S.S.E. from the ramparts to the church of St. Pierre.

The trade of Calais is chiefly derived from the passage of Englishmen through it, on their way to or return from the Continent; and from the residence of many English here. 'Every second person one meets on the quays is English. Almost all the shopkeepers speak some English, and all the waiters do. The inns are very large and numerous, and the French and the English tradespeople of Calais seem to make it their whole study to render the town and all connected with it as English as possible. English inns, English coaches, English baths, English schools, and a playhouse, English and French alternately. Englishmen are seen driving and riding about in all directions, and apparently of all trades and callings, from the squire down to the journeyman manufacturer,—the former followed perhaps by six or seven English pointers or setters, and the latter with his apron twisted round his waist, and bustling off to the English factories in the neighbourhood of the town. English ladies are seen walking in all the public walks, and English nursery-maids leading about whole strings of expatriated babies.' (*Letters from France*, by John M. Cobbett.) The population of Calais in 1832 was [illegible] that of the suburb of St. Pierre 5315 (or 6802 for [illegible]mmune), together 15,752. There is a daily commu[illegible]ation with Dover by steam-boats, and during the summer [illegible]m-boats go direct from Calais to London. The herring-fishery employs a number of persons; the mackerel-fishery not so many. A colony of English, which has settled in the neighbourhood of Calais, carries on a considerable manufacture of lace. There are schools of navigation and drawing. The town is ill supplied with water.

The district of which Calais was the capital was termed under the old monarchy Calaisis, or Le Pays Reconquis. It is a level country, intersected with canals; it produces corn and flax, and affords pasturage to a considerable quantity of cattle. It contains, besides Calais and St. Pierre, several villages, and the bourg or small town of Guines, between which and Ardres was held the splendid interview between Henry VIII. and Francis I., known as the interview of the Field of the Cloth of Gold, in 1520.

The canal from Calais to St. Omer runs S.E. from Calais to the Aa, the navigation of which forms the remainder of the line. The length of the canal from Calais to the Aa is about 15 miles, and the navigation of the Aa about 16 miles.

CALAIS, PAS DE. [PAS DE CALAIS, DEPARTMENT OF.]

CALAIS, ST. [SARTHE, DEPARTMENT OF.]

CALAITE. [TURQUOIS.]

CALAMINE. [ZINC SPAR.]

CALAMOPHYLLIA. [CARYOPHYLLIA.]

CALAMOPHORA. [FAVOSITES.]

CA'LAMUS, the genus of palms whose different species constitute the rattan canes of commerce. Although a genuine palm, yet from the slender stems, and general habit, it has more the look of some tall grass, and has been considered as one of the links in the chain of organization which connect the grasses with the palms. Dr. Blume gives the following account of the parts of fructification:—*Polygamous-diœcious*, or *diœcious*; spathes several, incomplete; flowers sessile, in spikes; calyx three-toothed or trifid; petals three, united at the base; stamens six; filaments subulate, connected at the base into a cup; anthers arrow-shaped, fixed by the back. The rudiment of an ovary:—female: ovary three-celled, surrounded by a staminiferous cup, which is usually sterile; style scarcely any; stigmas three, distinct or combined; berry protected by scales overlapping each other downwards, one-seeded; seed surrounded by a succulent flesh; albumen uneven in the circumference, even in the inside, or near even in the circumference and ruminated internally; embryo at the base; leaves pinnated.

The species are principally found in the hotter parts of the East Indies, where they grow in the forests, climbing over trees and bushes to a greater extent than any other known plants. The stem of Calamus verus is described as being 100 feet long, that of C. oblongus 300 to 400, of C. rudentum upwards of 500, and of C. extensus as much as 600 feet; Rumphius even states that one kind attains the extraordinary length of 1200 feet (vol. v. 100). It is closely covered over by the tubular bases of the leaves, through which it is drawn by the cane-gatherers when green; afterwards it is dried in the sun, and then is ready for market. Nearly four millions of these canes were imported into this country in 1832. They are extensively used for the sake of the hard flinty coating of their stems, which are readily split into strips, from which the bottoms of chairs and similar articles are manufactured. It is not possible to say from what particular species the canes of the shops are obtained, it being probable that many are gathered indiscriminately; C rotang has however been said to furnish the stouter, and C. scipionum the slenderer sorts. The flesh that surrounds the seeds of this genus is a delicate article of food; limpid water flows from the stems when cut through; and finally, the young shoots of some of them, while still tender, are roasted or boiled, chopped small, and being fried with pepper and gravy, are said to furnish a very delicate dish.

It is not a little remarkable that notwithstanding the polished surface of the stem, almost all the other parts except the fruit should be furnished with stiff hairs and even prickles. The prickles are usually hooked backwards, to enable the plants to raise themselves upon the trees among which they grow in their native forests; and to assist them in this operation the terminal pinnæ of the pinnated leaves are shortened, hardened, and also hooked backwards. Several species are copiously described in Rumphius's 'Herbarium Amboinense,' vol. v., under the name of Palmijuncus.

CA'LAMUS, dragon's blood. The greater part of the dragon's blood now met with in commerce is obtained from several species of this palm. The species which chiefly yield it are the *C. petræus* (Lour.), *C. rudentum* (Lour.), *C. verus* (Lour.), and *C. Draco* (Willd.), of which the last three were by Linnæus reckoned mere varieties of the *C. Rotang*. (Linn.) They are natives only of Hindostan, Cochin China, and the Moluccas. The ripe fruits are covered with a reddish-brown dry resinous substance. In this state they are collected, and allowed to remain in rice-mills till the resin drops off. The resin is afterwards melted, either by the natural warmth of the air or by artificial heat, and then moulded into the different forms in which it occurs in commerce. Another mode of obtaining it is as follows:—The ripe fruits are shaken in bags, and the resin so obtained is formed into pieces about the size of a bean, which are then wrapped up in leaves; this kind is much prized in the East Indies. A second sort is procured by throwing together the fruits after they have been treated in the foregoing manner, melting them in the sun or with a slow fire, and collecting what exudes, which is then formed into small four-cornered cakes. from what remains after the two foreg esses being run out and formed into round cakes, ntain hard portions of the fruit. According to oth accounts, the finest sort is procured by exposing the fruits to the vapour of boiling water, and scraping off the soft resin as it exudes.

It is sent to Europe in several forms. 1. Dragon's blood in tears (sanguis D. in lachrymis); 2. Dragon's blood in as (S. D. in granis); 3. Dragon's blood in reeds (S. D. culis), in rods about 1 to 1½ feet long, about the thick- of the finger, covered with the fronds of the palm, wrapped round it with split branches. This is the best kind now met with in European commerce.

Many other kinds of dragon's blood are procured from different trees in various parts of the world, of which two only are worthy of notice:—1. Dragon's blood in masses, obtained both in the East Indies and Madeira by wounding the stem of the *Dracæna Draco* (Linn.), occurs in large shapeless masses of a violet colour; 2. S. D. de Carthagena; American, or West Indian dragon's blood, obtained from the *Pterocarpus Draco* (Linn.). It occurs in pieces about 12 or 14 inches long, with a sharp angle on one side, partly wrapped up in the tendrils of a cissus and in leaves. Dragon's blood is a peculiar resinous colouring principle (*Draconia*), mixed with benzoic acid and other matters. It is insoluble in water, but easily soluble in alcohol, especially when boiling; it is also soluble in watery solutions of the caustic alkalis and forms with them a violet-coloured solution: it is less soluble in æthers and oils, but soluble in acetic acid; sulphuric acid chars it. Analysed by Herberger 100 parts yielded—

Fatty matter	2·00
Oxalate of lime	1·60
Phosphate of lime	3·70
Benzoic acid	3·00
Draconia	70·70

According to Herberger draconin is not an alkaloid, as Melandri thought, but a sub-acid.

Dragon's blood possesses no astringent properties, as was once supposed to be the case, owing to kino being confounded with it. It is now seldom used internally, but it is added to tooth-powders. It is however employed as a colouring matter and an ingredient in varnishes.

A spurious dragon's blood is often made with colophony, olibanum, turpentine, &c., coloured red with powdered Saunder's-wood. Gum Senegal is also dyed red with tincture of Saunder's-wood and passed for dragon's blood. The spurious is wrapped in the leaves of the Zea Mais or Indian corn.

Dragon's blood was known to the Greeks, and by them called *κινναβαρις*, *cinnabar*, a name which they also gave, as we now do, to a mineral, the red bisulphuret of mercury or *minium*.

CALAMY, EDMUND, B.D., of Pembroke Hall, Cambridge, was born in London, in 1600. He entered the university at the age of fifteen, and was honourably distinguished for his scholarship; but having incurred the resentment of the Arminian party by his opposition to their opinions, he was disappointed in obtaining a fellowship. His conduct, however, attracted the notice of the Bishop of Ely, Dr. Felton, who made him his domestic chaplain, and him the living of Swaffham Prior, in Cambridgeshire. kind patron took the greatest interest in directing the studies of Mr. Calamy, who lived with the bishop till his death. Soon after this event, in 1626, he resigned his vicarage, having been appointed one of the lecturers of Bury St. Edmunds. For the ten years that he officiated in this capacity he ranked among the conformists, though of that class which was opposed to the measures of the high church party. When at length Bishop Wren's Articles were published, and the order for reading the 'Book of Sports' began to be enforced, he publicly declared his objections to them, and left the diocese. Thirty other clergymen did the same. Soon afterwards he was presented to the valuable rectory of in Essex, where he had the prospect of living in but this place, so agreeable to him in other respects, o unhealthy that it brought on a quartan ague, from which he never perfectly recovered, and he was compelled to quit it. In 1639, being chosen minister of the church of St. Mary, Aldermanbury, he removed to the metropolis, having separated from the church, and openly avowed his attachment to the Presbyterian discipline. In the contentious controversies of that period on the su siastical affairs, Mr. Calamy bore a dist

His opinions against episcopacy were stated in a work, very popular in its day, entitled 'Smectymnuus,' written in answer to Bishop Hall's 'Divine Right of Episcopacy.' This composition was the work of five individuals, S. Marshal, E. Calamy, T. Young, M. Newcomen, and W. Spurstow, the initial letters of whose names were put together to form this singular title. As a preacher Mr. Calamy was greatly admired, and listened to by persons of the first distinction during the twenty years that he officiated in St. Mary's. His celebrity was so well established by his writings, as well as by the distinguished station that he occupied among the ministers in the he was one of the divines appointed by the House of Lords in 1641 to devise a plan for reconciling the differences which then divided the church, in relation to ecclesiastical discipline. This led to the Savoy conference, at which he appeared in support of some alterations in the Liturgy, and replied to the reasons urged against him by the episcopal divines.

Like most of the Presbyterian clergy, he was averse to the execution of the king, and to the usurpation of Cromwell; during whose ascendancy he held himself aloof from public affairs, resisted his proposition for a single government, and did not scruple to declare his attachment to the dethroned prince. Accordingly he was among the foremost to encourage and promote the efforts that were made for the restoration of Charles. He strongly recommended it in a sermon preached before the House of Commons, on the day prior to that on which the House resolved to invite the king back to his kingdom; and he was one of those deputed to meet Charles in Holland with the congratulations of the nation. On his majesty's return, he appointed Mr. Calamy one of his chaplains; the duty of which office, owing to prevailing animosities, he performed no more than once. He was also offered the bishoprick of Lichfield and Coventry, which it is thought he would have accepted, if he could have subscribed to the terms of the king's declaration. His moderation was such, that he appeared only desirous of removing those restrictions which affected the Presbyterian clergy, accompanied with such reforms in the services of the church as would have allowed a conscientious performance of their pastoral duties. But finding the temper of the high church party set upon their rejection by acts of further restraint and intolerance, he seized the opportunity of the passing of the Act of Uniformity to resign his living. Being well received at court, his friends recommended him to petition for an indulgence; but his request was fruitless. He did not, like some of the other ejected ministers, attempt to assemble a congregation elsewhere, but still continued to attend the church in which he had so long officiated. On one of these occasions, when no clergyman attended, some of his friends requested him to preach. After some hesitation he ascended the desk, from which it had always been his custom to deliver his discourses, and preached upon the concern of old Eli for the ark of God, into which he introduced some matter that touched upon recent events; which being deemed seditious, he was committed to Newgate, where he lay, until the outcry raised by his friends induced the king to order his liberation. He lived to see London in ashes; which event had such an effect upon his nerves, that he survived the melanc spectacle little more than a month. He died Octob 1666. Mr. Calamy was considered an able theolo His publications consist of single sermons preache particular occasions, and a vindication of himself aga attack made upon him by Mr. Burton, entitled 'The Man's Ark, or a City of Refuge in the Day of tress.'

Two of Mr. Calamy's sons, who were educated at Cambridge for the church, took opposite sides on the disputed points of ecclesiastical affairs; the eldest, Edmund, having, after his ejectment from his living, become a decided nonconformist; while his other son, Dr. Benjamin Calamy, not only adhered to the high church party, but wrote in its defence 'A Discourse about a Scrupulous Conscience;' the tenour of which is, to stigmatise as crime the act of separating from the church.

A grandson of Mr. Calamy was a celebrated non-conformist divine, and is the well-known biographer of the ejected ministers; and also of Baxter's 'Life and Times.' This gentleman, also called Edmund, after his grandfather, on a visit to Scotland in 1709, receiv [illegible] in divinity [illegible] of the universities of Aberdeen, Edinburgh, and Glasgow. (Calamy's *Nonconformist's Memorial*.)

CALA'NDRA (*Clairville*), a genus of coleopterous insects belonging to the section Rhynchophora, and family Curculionidæ. Technical characters:—antennæ eight-jointed, geniculated, and inserted behind the middle of the rostrum (*i. e.*, towards the base), the six joints following the basal one are short, the apical joint forms a large knob, generally somewhat hatchet-shaped, having the apex soft and spongy: rostrum long, and slightly bent downwards: thorax rather long and depressed, narrower in front than behind: body somewhat depressed and pointed at the apex: elytra shorter than the abdomen: legs short, tibiæ armed with a spine: tarsi four-jointed, the penultimate joint bilobed.

The well-known corn-weevil (*C. granaria*), which commits so much havock in our granaries, belongs to this genus: it is about one-sixth of an inch long, or rather less; of a pitchy red colour; the thorax is coarsely punctured, and the wing-cases are deeply striated; the striæ are minutely punctured; the legs and antennæ are red.

This little insect bores a hole into the grain with its proboscis, in which an egg is deposited; the egg turns to a little grub or larva, which devours the whole of the inside of the grain, leaving the husk entire. This quantity of food is just sufficient to mature the grub: it then turns to the pupa, and afterwards to the weevil, which easily breaks through the husk, and is then at liberty to proceed as its parent did. When wheat is suspected to contain these little weevils or their grubs, that which is affected may be easily discovered by throwing the whole into water; that which is good will sink, while the rest will float.

Another species of Calandra (*C. oryzæ*, L.) closely resembling the corn-weevil, from which however it may be distinguished by its having four red spots on its elytra, attacks the rice grain in the same way as the one above-mentioned does that of the wheat.

Calandra palmarum, an immense species, being about an inch and a half in length, lives during its larva state on the pith of the palms of South America.

It is of a dull, velvet-like black, and has the proboscis furnished with a brush of black hairs on the upper part near the apex.

The larva of this species, which is called by the natives the *ver palmiste*, is considered by them a great dainty.

CALANUS. [BRANCHIOPODA.]

CALA'NUS, an Indian philosopher of the sect called by the Greeks Gymnosophists, or naked philosophers. Alexander the Great, in the course of his Indian expedition, met with a body of these singular men, and, being desirous of speaking with them, he deputed Onesicritus to invite them to visit him. Dandamis, their chief, refused to go himself or to allow any of his followers to go, saying, that he was as much the son of Jupiter as Alexander, and that he wanted nothing from Alexander, but was quite satisfied with what he had. Calanus was the only one who could be prevailed upon, and, amidst the reproaches of his colleagues, he consented to accompany Alexander in his expedition. On arriving at Pasargada in Persis he fell ill. He had never been ill before, and would not now submit to be nursed or doctored, but insisted on being burnt. After many fruitless endeavours to dissuade him from his resolution, Alexander ordered a splendid pile to be raised, and a golden couch to be placed on it by Ptolemæus, son of Lagus. Calanus was driven in a carriage to the spot, crowned after the Indian fashion, and, chaunting hymns to the gods in the Indian tongue, he mounted the pile, and laid himself down in the sight of the whole army, and continued motionless amidst the flames. As soon as the fire had been kindled, trumpets were sounded, and it is said that even the elephants joined the army in raising a war-shout in honour of Calanus. The various ornaments with which Alexander had ordered the pile to be decorated were distributed to those who were present. While Calanus was riding to the pile, Alexander asked him if he had any requests to make. He replied, 'No; I shall see you soon in Babylon.' Alexander died soon after in Babylon, B.C. 323. Calanus was in his 73rd year when he died. (Strabo, xv. 1; Arrian, vii.; Cic. *De Div.* i. 23; Valer. Max. i. 8.)

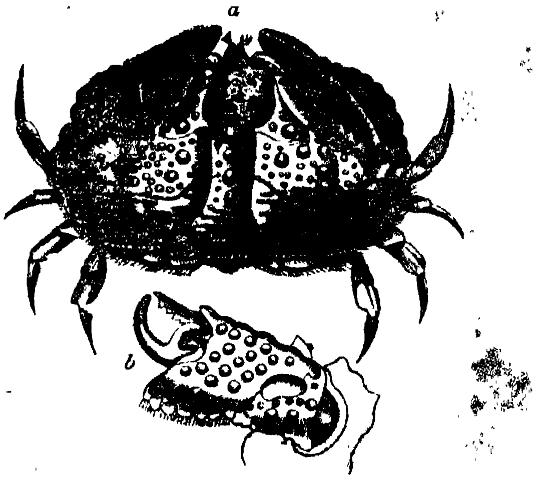
CALAPPA (Zoology), a genus of brachyurous decapod crustaceans, separated by Fabricius, and formerly embracing the genus Hepatus of Latreille, though now restricted to the following form.

Generic character.—Ex[illegible] næ similar to those of the crab (*Cancer*) proper[illegible]lled [CRAB]. third articulation of the pedipalpi ([illegible] *mâchoires exterieurs*) terminated somewhat like a pointed hook: chelæ equal, very large, compressed, with their upper edge, which is notched or crested, very much elevated, and fitting exactly to the external border of the shell or carapace, so as to cover the entire region of the mouth: the rest of the feet short and simple: carapace short, convex, wider posteriorly than anteriorly, and forming, behind, a vaulted shield, under which the posterior legs are hidden when the animal is in a state of repose: eyes mounted on short pedicles, and at a short distance from each other.

The genus is well marked by the peculiarities of the shell and chelæ, with which last, as with a shield, the Calappæ cover the mouth and anterior parts, at the same time contracting up their feet beneath the posterior vaults of the shell, under whose hard protection their vulnerable parts are comparatively secured from the attacks of their enemies. They are called by the French *migranes*, and also *coqs de mer*, from their crested chelæ, as well as *crabes honteux*, from their appearing to hide their heads and smaller limbs behind their large chelæ. Their geographical distribution is wide. The species are recorded as inhabiting the seas of the Indian Archipelago, and of New Holland; the Pacific and Atlantic oceans; the seas of South America, &c. The proximate form is found in the genus *Œthra* of Leach. [ŒTHRA.]

We select as an example *Calappa granulata*, an inhabitant of the Mediterranean sea, and found, according to M. Risso, most frequently in the fissures of rocks near Nice, where these crabs reach to the depth of ninety feet. The same zoologist says, that the females deposit their eggs in summer; and that there is a variety whose shell is six-toothed posteriorly, and whose general colour is pale rose, with whitish feet and brown nails.

The following is Desmarest's description of *Calappa granulata*:—Carapace verrucose, marked with four longitudinal sutures, and having on each side before it begins to dilate seven teeth, three short and obtuse, and four more strong and pointed upon the borders of the enlarged part, with two other smaller ones entirely behind: front bidentated: colour, that of flesh sprinkled with spots of carmine red; length two inches and a half; breadth three inches, six lines, French.



[Calappa granulata.]

a, The crab with the limbs exserted. *b*, The right chela.

CALAS. [VOLTAIRE.]

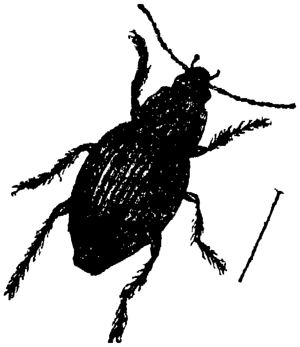
CALATHI'DIUM, a modern name for the [illegible]arious [illegible] the plants called Compositæ, the commo[illegible], from the [illegible]. It consists of a flattish or conical cellu[illegible]ous, with the excep- receptacle, upon which a number of [illegible] generally presents a compactly arranged; and its surface[illegible]ly more or less trans- even, except so far as the scars left[illegible]duces in a remarkable the flowers render it otherwise, or co[illegible]ht: this property is [illegible] or scales, named paleæ. Its margi[illegible]celand, and hence kno with one or more rows of small leaves[illegible]ground-form, being in close the flowers as within a cup. The larger crystals.

[illegible]merate the localities

ture, and proportions of these scales often afford good generic characters. In reality, a calathidium is a short spike of inflorescence, the receptacle being the depressed axis, its paleæ bracts, and the external scales being other bracts in a more perfect state. The daisy, the dandelion, or the sunflower, offer illustrations of this form of inflorescence. (See *Lindley's Introduction to Botany*, second edition, page 133.)

CA'LATHUS (*Bonelli*), a genus of coleopterous insects of the section Geodephaga, and family Harpalidæ. Technical characters:—body elongate, somewhat ovate, slightly pointed posteriorly: thorax wider behind than before: anterior tarsi with the three basal joints dilated in the males: claws dentate beneath: palpi with the terminal joint almost cylindrical, and truncated: labrum transverse, and slightly emarginated anteriorly.

Upwards of twenty species of this genus have been discovered, almost all of which are European; their general colouring is black or brown; one or two metallic-coloured species however are known. In England eight species have been enumerated, most of which are common: four species may be found under stones and rubbish in the neighbourhood of London; of these *C. cisteloides* is exceedingly common, frequently being met with in pathways, &c.: it is about half an inch long, and of a black colour; the antennæ are pitchy black, with the basal joint red; the legs are black, and in some specimens red. The wood-cut here given of *C. latus* will enable the reader to form an idea of their general appearance: it is a very rare species in this country, and differs chiefly from the one above-mentioned in its greater width, and the thorax having the lateral margins of a reddish hue.



[Calathus latus.]

CALATRA'VA, on the south bank of the Guadiana, 21 miles from Toledo, known as the Oretum or Oria of the Oretani, under the Romans, was, in the middle ages, that strong-fortified town of La Mancha which, from its proximity to the Sierra Morena, the lofty barrier between Castile and Andalusia, became the key of the former, and the theatre of war in the 12th century, against the Moors of the latter province. It is now reduced to a single tower, with the appellation of Calatrava la Vieja (the Old), in contradistinction to the great convent (erected in 1214) of the military order of that name, three leagues from it, which is called Calatrava la Nueva (the New).

In 1158 Sancho II. of Castile and III. of Leon took the primitive town and gave it to the Templars. The Templars, who seemed unable to prevent its re-conquest by the Moors, returned it to the king. Diego Velazquez, a Cistercian monk, although sprung of high rank, persuaded Saint Raymond, the first abbot of Fitero, in Navarre, a monastery of the same order, to offer his order, with their numerous devoted followers, to King Sancho, who readily granted the [illegible] them. Thus Calatrava was not only rescued from [illegible] many of its new defenders became Cistercians, [illegible] make excursions against its assailants. Raymond, [illegible] leading person, was so successful in his [illegible] the same year, 1158, he founded the [illegible]rava, under the rule of Saint Benedict [illegible] the Cistercian. That incorporation [illegible] Alexander III. in 1164; and Gregory [illegible] 1187. Innocent III. ratified it in [illegible] the order, assisted by [illegible] Calatrava, which had [illegible] when its defenders retiring to Salvatierra, were named, for a short period, knights of that place.

Having at first retained the Cistercian habit, this military brotherhood soon shortened it, and made it more suitable to the field. Finally, they adopted a secular dress for common use, and one for ceremony, consisting of a mantle of white silk, tied with a cordon and tassels, like that of the Garter, but having on the left arm a cross floury embroidered gules, a description which those who are acquainted with the language of heraldry will fully comprehend.

This institution, says Mariana, gradually degenerated. In 1485 the joint sovereigns of Aragon and Castile, Ferdinand and Isabella, united, with the consent of Innocent VIII., the grand mastership of Calatrava to the crown. At last the rich and honourable commanderies, once the reward of illustrious warriors, were frequently bestowed on greedy and undeserving favourites. Eighty-three of those dignities, and eleven priories, yielding a most splendid total annual revenue, are the only traces of the long by-gone glory of a sort of patriotic crusaders, who acquired the title of 'the gallant order,' while the knights of Alcantara had only the aristocratic epithet of 'the noble,' and those of Santiago the boastful epithet of 'the rich.'

Don Gonzalez Yañez instituted in 1219 a religious order of Calatrava for ladies, whose badge was the same as that of the knights, only embroidered in the front of the dress.

CA'LCAR (*Dejean*), a genus of coleopterous insects, of the section Heteromera and family Tenebrionidæ. This genus is distinguished from the allied genera (*Hypophlæus*, *Apis*, *&c.*) by having the body linear, the head emarginated anteriorly, and the three or four terminal joints of the antennæ nearly globular; the thorax is longer than broad, truncated anteriorly and posteriorly, and of nearly equal width throughout.

CALCAR, or spur in flowers, is a hollow projection from the base of a petal, and has usually a conical figure. It was called nectary by Linnæus, but it rarely secretes honey. Its use is unknown. The spurs of some orchidaceous plants are several inches long, and many times longer than the flowers to which they belong, hanging down like vegetable tails.

CALCAREOUS SPAR. Under this term it is usual to include only those varieties of carbonate of lime which occur in distinct individual crystals of the rhombohedral system, the name never being used to denote arragonite, or any crystals of carbonate of lime belonging to the prismatic system; nor is it usual to apply it to those more or less crystalline limestones of which marble is the purest variety, where each crystal is so imbedded in the mass as to have lost all individuality. In a word, these rocks are of such importance and interest, that they do not admit of our treating them as a mineralogical variety, but as masses formed by the aggregation of numerous crystals of it. These, therefore, will be found described under the heads LIMESTONES and MARBLE, while we shall here confine ourselves to the individual crystals of which the others are composed.

This substance presents us with one of the most interesting objects which can engage the attention of the mineralogist, not only on account of the important part it plays in the geological structure of the earth, being frequently almost the sole ingredient of beds of rock of great thickness and extent, produced at every geological epoch, but also from the beauty and diversity of its crystalline forms, and from the peculiarity of several of its physical properties. The study and a correct knowledge of this mineral species have also of late become of still greater importance, since the discovery of the principles of isomorphism, by which it is shown that it is the most perfectly developed individual of a very large class of the mineral salts of carbonic acid of which it may consequently be considered the type.

If any crystal of calcspar, whatever its form, be carefully examined, an appearance indicating a tendency in its substance to break or split in the direction of three planes symmetrically related to the form may be perceived, and by a gentle blow the whole is readily reduced to fragments, each of which may, with a little care, be brought to the form of the rhombohedron represented in *fig.* 2, the faces of which are parallel to the three planes of cleavage above-mentioned. This, in the language of Haüy, is the primitive form of calcspar, and represents, according to his theory, the shape of the ultimate molecules or atoms of carbonate of lime, by the aggregation of which, according to certain laws, its various [illegible] Although this rhombohedron occurs rarely or never as an unbroken crystal of pure carbonate of lime, it is nevertheless the most convenient ground-form, to the axis of which the faces of all other crystals of this substance may be referred, and it is therefore selected for that purpose. These forms, although far exceeding in number those observed in any other mineral species, are however (omitting the regular hexagonal prism, *c*, and its terminal faces, *o*, *fig*. 6), but of two kinds, being either rhombohedrons, of which varieties are represented in *figs*. 1, 2, 3, and 4, or scalinohedrons, one of the most common of which is seen in *fig*. 5. Their relations to each other and their combinations have been developed principally by Haüy, Bournou, and Monteiro, by whom no less than 30 different rhombohedrons and 50 scalinohedrons have been distinguished. As might naturally be expected, the combinations resulting from so large a number of simple forms is exceedingly great, and Bournou, who has written a treatise of three thick volumes on this mineral and arragonite, has distinguished no less than 700 varieties of form. Of these 154 are described in the large work by Haüy, accompanied by very accurate drawings of each.

A general knowledge of the crystalline form of this mineral may however be easily obtained by acquiring a knowledge of the relation of the faces of the five simple forms and the hexagonal prism referred to above; as, in almost all the more ordinary combinations, the general feature of the crystal is produced by one of these. The *fig*. 2, which, as has been already stated, is considered as the ground-form, is a rhombohedron, the faces of which are inclined to each other in the terminal edges at 105° 5′. This form, though exceedingly rare in pure calcspar, is however the prevailing crystal in the nearly allied species produced by the combinations of the carbonates of lime and magnesia, as will be seen by referring to BITTERSPAR and DOLOMITE. In determining the relations of any form, the position of the planes of this rhombohedron in reference to the other parts must first be fixed, and this is readily accomplished in every case, owing to cleavage planes running parallel to its faces. This being determined, all other rhombohedrons are at once divided into rhombohedrons of the first order, such as *fig*. 4, which have their faces situated as the faces of the ground-form, or into rhombohedrons of the second order, the faces of which are situated as the edges of the ground form, as is the case with *figs*. 1 and 3.

The rhombohedron *fig*. 1, which may thus be seen to belong to the second order, is readily recognized by having its faces *g* making the same angle with the vertical axis A B as the terminal edges of the ground-form, so that in a combination the terminal edge of the ground-form is truncated by the plane *g*. This rhombohedron, which is called the first obtuser, has the angles at the terminal edges 135° 57′, and has with the same breadth its vertical axis one-half that of the ground-form. It is one of the most common of the rhombohedrons, and is frequently found alone, but still more frequently in combination with the hexagonal prism, producing the form seen in *fig*. 7. It occurs frequently at Andreasberg in the Hartz, and in the mines of Derbyshire.

The rhombohedron, *fig*. 3, is also of the second order, and is called the first obtuser: its terminal edges correspond with the long diagonals of the faces of the ground-form, and therefore with the same breadth, its vertical axis is double that of the other: the inclination of the faces at the terminal edges is 78° 51′. In combination with the ground-form, if the faces *f* predominate, the form P appears as truncations of the terminal edges; if P predominates, the faces of *f* produce truncations of the six lateral angles, the edges of intersection being parallel to the inclined diagonals of P for two faces, and with the horizontal one for the third.

The rhombohedron, *fig*. 4, bears to *fig*. 3 the same relation as this does to the ground-form, the terminal edges of the first corresponding with the inclined diagonal of the second: the inclination of the planes to each other in the terminal edges is 65° 50′.

Fig. 5 is one of the more common scalinohedrons, and is commonly [illegible] as the Dog's-tooth Calcspar, and is found frequently [illegible]byshire and other localities. It bears a close connection with the rhombohedrons P and *m*, having the lateral edges of the first and terminal edges of the latter, so that in combination with the first the form *fig*. 8 is produced, and with the second it forms a bevelment of the terminal edges: the inclinations of the faces in the terminal edges are respectively 104° 38′, and 144° 24′. This form frequently occurs in twins, formed by two crystals growing on each other, their principal or vertical axes being in the same right line, and the two crystals so situated that the obtuser terminal edges of the one abut on those of the other, and the acuter on the acuter.

Fig. 1.

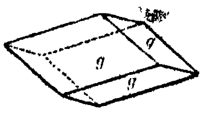


Fig. 2.

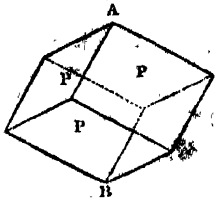


Fig. 3.

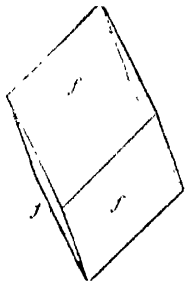


Fig. 4.

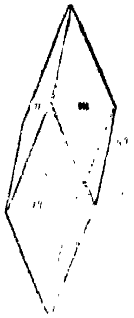


Fig. 5.

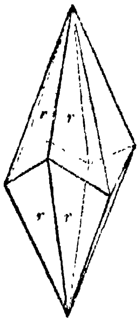


Fig. 6.

Fig. 7.

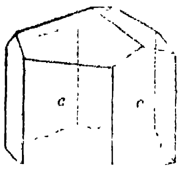
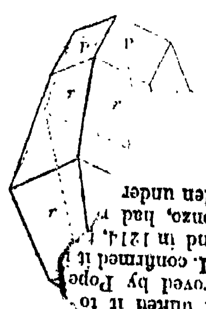


Fig. 8.



This mineral may be recognized by its [illegible] parallel to the faces P: the specific grav[illegible] crystals is 2·721; and the hardness is in the [illegible] 3, being situated between gyps and fluor spa[illegible] itself colourless, but frequently occurs of various [illegible] yellow, green, red, brown, and even black, from the admixture of impurities. Its glance is vitreous, with the ex[illegible] tion of the terminal face *o*, which generally presen[illegible] mother-of-pearl lustre. It is usually more or less translucent, and when transparent produces in a remarkable degree the double refraction of light: this property is best seen in the varieties obtained from Iceland, and hence known as Iceland-spar, and occurs as the ground-form, being in fact merely broken fragments of other larger crystals.

It would be useless to attempt to enumerate the localities where this crystal is found, it being a common ingredient of every mine. It is perhaps sufficient to state that the lead mines of Derbyshire and Cumberland, and of Andreasberg in the Harz, are noted as affording the most beautiful crystals, and the greatest diversity of forms.

CALCEDONY. [QUARTZ.]

CALCEOLA'RIA, a genus of very ornamental herbaceous or shrubby plants, belonging to the natural order Scrophulariaceæ. Its distinctive characters are, principally, the flowers being diandrous, with a two-lipped corolla, the lower lip of which is much larger than the upper, and inflated so as to resemble a bag. All the species are South American, and are confined either to the western side of the Cordilleras, or to the southern extremity of the continent and its adjacent islands: in Chili and the mountainous parts of Peru, they are so common as to give a peculiar appearance to the vegetation. Some of them are lowlanders; others inhabit the highest parts of the Andes in the districts just below the regions of lichens and mosses; and thus, if both their wide geographical distribution and the various elevations at which they occur are taken into account, they are exposed to every kind of climate between those of England and Barbary. On this account no certain rules for their treatment in gardens can be laid down with reference to the whole genus; but the Chilian species will require to be separated from the Peruvian or Patagonian in the practice of all good gardeners; as well as those which, like *C. arachnoidea*, are hardy, from such as require the protection of a green-house or frame in winter.

The greater part of the genus has yellow flowers, a few have purple ones, and here and there in nature species occur with the two colours intermixed, by the addition of spots of purple to the yellow ground colour, the latter changing the former to a deep rich brown. By intermixing artificially the two colours natural to the genus, a production of hybrid varieties has resulted, and some crosses of extraordinary beauty have been obtained, especially from *C. integrifolia, corymbosa, arachnoidea, Chiloensis, crenatiflora, viscosissima*, &c., all species that have been figured in the 'Botanical Register.' These species, being all Chilian, have given its character to the English mode of cultivation, which, as it is the most successful of all, we shall briefly explain from Mr. Plant's statement in the 'Horticultural Register,' vol. ii., p. 266. 'Seeds are to be sown in the summer sufficiently early to produce by the month of December good stout plants fit for blooming the following year. They are to be placed in pots, size No. 48, in an airy part of a green-house. As the roots appear at the hole in the bottom of the pots, the plants are to be successively shifted into larger pots, care being taken to disturb the roots as little as possible. Finally, by the beginning of March the plants will have acquired such a size, that they may be removed to pots, size No. 12. At this time great care should be taken to keep the plants well ventilated, and the soil just moist, without ever being saturated. At the end of April or beginning of May, the plants are to be removed to a cold frame for ten days or a fortnight, in order to harden them gradually. If they are to flower in pots, the size used is what we call peck-pots, and these should be well drained with potsherds according to the hardness of the pots, and afterwards filled with the following compost: *viz.*, two parts of fully decomposed stable manure, one part of leaf or vegetable mould, and one part of fine white sand, or, in the absence of that, one part of sandy-peat. Mix these well together, and beat the compost fine, rubbing it through the hands to break the lumps; for this process will answer much better than sifting. This compost is suitable for C. Youngii, farinosa, fuscata, picta, picta pallida, Atkinsonii and Morrisonii. The polyantha is, according to my taste, one of the most interesting of the yellow-flowering species; the individual flowers are not so large as some of the others, but the very elegant habit of the plant, and the profusion of flowers it bears, render it very striking. I had a plant of this sort, treated as above, in full flower last July, formed a complete cone two feet and a half high, with at least 500 blossoms of the full size at one time; but I find this, together with C. Wheleri, atrosanguinea, Hopeana, Youngii-pallida, Epsomensis, monstrosa, pulchella, white and crimson, ochre and crimson, and cream and crimson, delights in a compost something different from that recommended for C. Youngii, &c. Instead of any vegetable mould, add to the dung and sand one-fourth part turfy loam, as free as possible from oxide of iron. To have any fine sorts in flower late in the autumn, nothing more is necessary than, as soon as the terminal flowers of the principal racemes are got to the full size (I am supposing the plants to be blooming in pots during summer), to cut the entire branches down to within an inch of the surface. Then take off about an inch of soil, and replace with fresh compost, *sifted;* this will in general happen about the end of July. When this is done, place the plants in a cold frame where they can be sheltered from rains by a covering, and in about a month they will be fine, vigorous plants, producing plenty of flower-stems, which will flower in the green-house during October and November. The sorts best calculated for the second blooming are—Calceolaria Youngii, polyantha, Youngii pallida, picta, picta pallida, white and crimson, cream and crimson, ochre and crimson, Wheeleri, farinosa, monstrosa, Atkinsonii, atrosanguinea.'

CALCINATION. This chemical term is derived from *calx*, the Latin for quicklime, which, as well known, is prepared by the action of heat upon limestone: the old chemists, therefore, employed the word calcination to express any supposed analogous change; for example, when certain metals, as tin and zinc, are exposed to heat and air, they were said to be *calcined*, and the product was called a *calx*, as of tin or zinc.

It will be observed, therefore, that different operations were included in this term; first, the expulsion of carbonic acid, as when lime is prepared; secondly, the acquisition of oxygen when the metals are heated, and the results of the action of heat and air upon them were termed *calces:* thus calx of tin is now called oxide of tin.

The term calcination is yet employed to express the separation of the volatile from the more fixed parts of a body: thus bones which are heated till they become black are termed *burnt bones;* but when, by the further operation of heat, they become white, they are called *calcined bones;* so also we say calcined flints, calcined clay, sulphate of lime, &c. But what were formerly termed metallic calces or calcined metals are now described as metallic oxides.

CALCIPHYTÆ. [CORALLINES.]

CALCISPONGIA. [SPONGIA.]

CAL'CIUM, a peculiar metal, of which lime is the well-known oxide. It was first obtained by Davy, in 1808, by the action of voltaic electricity; he made chalk or carbonate of lime into a paste with water, and placing it on a plate of platinum, a cavity was made in the paste to receive a globule of mercury. The mercury was rendered negative and the platinum positive by means of a battery of about 100 double plates. In this way the lime being decomposed, its metal formed an amalgam with the mercury. This amalgam was distilled in glass tubes filled with the vapour of naphtha. In an experiment in which the greater part of the mercury was expelled, the tube broke whilst warm, air entered, the metal, which had the colour and lustre of silver, instantly took fire, and burnt, with an intense white light, into lime.

That calcium is a white combustible metal is nearly all that is known respecting it; but many of its compounds with other elements have been long known and extensively employed:—the first we shall mention is lime, resulting from the union of

Oxygen and calcium: these substances combine to form two compounds, viz. lime, or the protoxide of calcium, and the peroxide of calcium. It has just been mentioned that calcium and oxygen unite with great force of affinity, which of course prevents calcium from occurring in nature uncombined with this element. Lime has been known from the remotest antiquity, and is one of the most abundant and universally diffused substances in nature. It is never found pure, but always combined either with other earths, or more generally with acids, for example with carbonic acid in marble, chalk, limestone, and calcareous spar, and in the shells of fish and eggs of birds; with sulphuric acid it constitutes sulphate of lime, or gypsum; with phosphoric acid it forms animal bone; and with silica and other earths it enters into the composition of many minerals and precious stones.

Lime is easily obtained in a pure state: the carbonate or any limestone free from impurity is to be mixed with coal or charcoal and exposed to a strong heat; in this way the carbonic acid is expelled, and the lime, or oxide of calcium, remains: this is, in fact, the common process of lime-burning, and the product is frequently called quicklime. Lime is composed of

1 Equivalent of calcium = 20
1 „ oxygen = 8

Equivalent = 28

The properties of lime are, that it is white, opaque, inodorous, and its taste is acrid and alkaline; its specific gravity is 2·3. It is infusible in the strongest furnaces; but it is said to have been fused by the oxyhydrogen blowpipe. By exposure to the air it attracts moisture and carbonic acid, and falls to powder. Lime has great affinity for water, and two compounds of them are formed; one is solid and called *hydrate of lime*, and the other is *lime-water*.

Hydrate of Lime, or, as it is usually called, *slaked lime*, to distinguish it from *quicklime*, is readily prepared by sprinkling this earth with water; it almost immediately heats, cracks, swells, and becomes powdery. During this operation part of the water is rendered solid and combines with the lime, while another portion is expelled in vapour, light as well as heat being evolved; indeed the degree of heat has been found sufficient to set fire to buildings in which lime has been accidentally exposed to water. Hydrate of lime is composed of

1 Equivalent of lime = 28
1 „ water = 9

Equivalent = 37

Lime-water is easily prepared by adding the earth to water, but it is better to employ the hydrate for this purpose; and it is a curious circumstance, first noticed by Dr. Priestley, that cold water dissolves a larger quantity than hot: thus an imperial pint of boiling water dissolves only 6¾ grains of lime, but at near 32° it takes up almost exactly 13¼ grains. When lime-water prepared with cold water is heated to ebullition it deposits crystals of lime; but it does not part with any at common temperatures.

Lime-water has a disagreeable taste, and the alkaline property of turning vegetable yellows brown and blues green. When it is exposed to the air the lime speedily attracts carbonic acid, and pellicle after pellicle of carbonate of lime being formed, the whole of the lime is eventually precipitated: hence the necessity of keeping this solution out of the contact of the air.

Lime is employed for a vast number of purposes in common life, the arts, and manufactures. Among its most important applications are the making of mortar, and the amelioration of certain soils; it is extensively used also in soap-making, leather-dressing, dyeing, and for various medicinal purposes.

Peroxide of calcium was discovered by Thenard; he procured it by the gradual addition of lime-water to peroxide of hydrogen. Small brilliant scales are soon formed, but if much lime-water be added at once, then the peroxide of calcium is pulverulent; it is in the state of hydrate, and decomposes spontaneously, losing its excess of oxygen even when left under water, and also by drying in vacuo. It is composed of

1 Equivalent of calcium = 20
2 „ oxygen = 16

Equivalent = 36

Neither azote nor hydrogen combines with calcium.

Chlorine and calcium form one chloride; the quantity of calcium hitherto obtained has been too small to admit of this compound being formed by direct action; several modes of combination may however be resorted to: thus when chlorine gas is passed over lime heated to redness in an earthen tube, oxygen gas is expelled and chloride of calcium remains. It is however more easily procured by saturating hydrochloric acid with lime, evaporating the solution to dryness, and exposing the residue to a red heat to expel the whole of the water. In this operation the hydrogen of the hydrochloric acid unites with the oxygen of the oxide of calcium; water is formed and expelled, while the metallic chloride remains.

The properties of chloride of calcium (formerly called muriate of lime) are, that it is colourless, possesses a crystalline appearance when broken, is inodorous, and has an extremely bitter saline taste. It is very deliquescent, and on account of this property it is frequently employed in chemical researches to separate water from gases in order to render them dry, and also to combine with this fluid and with alcohol in [illegible] other cases. It fuses readily by heat, and while in this state and exposed to air a portion of chlorine is expelled and lime is formed. Chloride of calcium, after being heated, shines in the dark, and was formerly called Homberg's phosphorus. It is composed of

1 Equivalent of chlorine = 36
1 „ calcium = 20

Equivalent = 56

When a concentrated aqueous solution of this salt is suffered to cool, crystals are deposited which, like the anhydrous chloride, are extremely deliquescent. They consist of

1 Equivalent of chloride of calcium = 56
7 „ water = 63

Equivalent = 119

These crystals are remarkable for the great degree of cold which they occasion when mixed with snow; but the anhydrous chloride dissolves in water with the extrication of heat.

A subchloride of calcium probably exists, but it is quite unimportant.

Bromide of calcium is obtained by passing the vapour of bromine over red hot lime: as in the case of the similar action of chlorine, oxygen is evolved and bromide of calcium formed. It is a colourless, bitter, deliquescent substance which readily dissolves in water, with the evolution of heat. The aqueous solution does not easily yield crystals, but they contain much water. Bromide of calcium is composed of

1 Equivalent of calcium = 20
1 „ bromine = 78

Equivalent = 98

Carbon and calcium form no compound.

Sulphur and calcium may be made to unite in three proportions. The sulphuret or proto-sulphuret is obtained by mixing anhydrous sulphate of lime with one-fifth of its weight of powdered charcoal, and heating the mixture to whiteness for two hours in a covered crucible. It is a reddish-white compound, which is but slightly soluble in water, and suffers but little change even when long kept in it. The aqueous solution is colourless, and has an alkaline and hepatic taste; when evaporated in vacuo, white crystals of the sulphuret are formed. When acted upon by hydrochloric acid, sulphuretted hydrogen gas is evolved. This sulphuret shines in the dark, and has been called Canton's phospho- It is composed of

1 Equivalent of calcium = 20
1 „ sulphur = 16

Equivalent = 36

Bisulphuret of calcium is obtained by boiling, but not to saturation, hydrate of lime and sulphur in water. On cooling, yellow crystals are obtained, which are soluble in 400 times their weight of water at 60°, but much more so in boiling water. They consist of

1 Equivalent of calcium = 20
2 „ sulphur = 32

Equivalent = 52

and contain about 43·5 per cent. of water. When lime and sulphur are boiled together in water, till sulphur ceases to be taken up, persulphuret of calcium is formed, consisting of

1 Equivalent of calcium = 20
5 „ sulphur = 40

Equivalent = 60

This compound was some years ago proposed to be employed in bleaching; but at present we believe no such use is made of it.

Phosphorus and calcium constitute the phosphuret, and like all the binary compounds of this metal hitherto described, except the oxide, it is entirely an artificial product. It is prepared by heating lime in a glass matrass with a long neck by a spirit lamp, and throwing small pieces of phosphorus upon it. A mixture of phosphate of lime and phosphuret of calcium is procured, which is of a brown colour.

This phosphuret readily decomposes water and phosphuretted hydrogen gas is evolved, and when dissolved in hydrochloric acid this gas is abundantly procured. It has not been analyzed.

Selenium and calcium may be combined by exposing a mixture of selenium and lime to heat a little below redness. The resulting seleniuret is a brownish-black substance which has neither smell nor taste, and is insoluble in water; when heated to redness it loses selenium and seleniuret of calcium is obtained. Crystals of this substance may be formed by preparing a solution of lime in hydroselenic acid and exposing it to the air. It is composed of

1 Equivalent of calcium = 20
1 " selenium = 40

Equivalent = 60

No compound of boron and calcium is known.

Fluorine and calcium occur largely in nature, in combination, and form *fluoride of calcium*, called by mineralogists fluor spar. [FLUOR SPAR.]

Cyanogen and calcium form a cyanuret which has been but slightly examined; it is obtained by saturating hydrocyanic acid with hydrate of lime. It exists only in solution: by evaporation it is converted into carbonate of lime and ammonia.

Acids and lime combine to form a numerous class of salts; of these the more important only will be described; two of them, viz. the carbonate and sulphate, occur in great plenty in almost every part of the earth; and the phosphate is more rarely met with.

Nitric acid and lime very readily combine and yield nitrate of lime. It may be formed either by adding lime or chalk to the nitric acid. A colourless solution is obtained which is extremely bitter, and by evaporation long prismatic crystals are formed which, like the anhydrous salt, are extremely deliquescent; these crystals dissolve in one-fourth of their weight of cold water, and in all proportions in boiling water; they are also very soluble in alcohol. Nitrate of lime is readily decomposed by heat; the residue gives a feeble light in the dark, and has been called *Baldwin's Phosphorus*; it is stated to be composed of nitric oxide, nitrous acid, and lime; but when the heat is very long continued then pure lime is obtained. Nitrate of lime is formed of

1 Equivalent of nitric acid = 54
1 " lime = 28

Equivalent = 82

It is found in considerable quantity in the spring water of Stockholm; it is applied to no use.

Carbonic acid and lime form carbonate of lime. [CALCAREOUS SPAR.]

Carbonate of lime constitutes the greater part of all shells, and enters into the composition of bones: like sulphate of lime, it is found in most spring waters, held in solution by an excess of carbonic acid; and to this in part the hardness of water is owing.

Carbonate of lime is composed of

1 Equivalent of carbonic acid = 22
1 " lime = 28

Equivalent = 50

This compound may be artificially procured by several processes, as by passing carbonic acid gas into lime-water, or by adding an alkaline carbonate to a solution of any salt of lime in water. The precipitate is at first bulky, but in a short time settles so as to occupy comparatively little space. Carbonate of lime is insoluble in water, and decomposed by most acids with the evolution of carbonic acid gas. It is in various forms largely employed, as in lime-burning, glass-making, the reduction of iron, &c.

Sulphuric acid and lime form sulphate of lime, frequently called gypsum, selenite, and plaster of Paris. It occurs largely in the mineral kingdom.

Sulphate of lime may be prepared artificially by several processes, as by mixing a solution of chloride of calcium or of nitrate of lime with one of sulphate of soda, or with dilute sulphuric acid. A bulky colourless precipitate is obtained when the solutions are moderately strong, which is sulphate of lime. This salt is nearly tasteless; it requires nearly 462 times its weight of boiling water for solution, and it is nearly as soluble in cold water. It is insoluble in alcohol. It is met with in most river and especially in spring waters, and is one of the salts which imparts to them the property called hardness. The air has no effect upon it; the artificial as well as the natural crystals contain water, and the salt is composed of

1 Equivalent of sulphuric acid = 40
1 " lime = 28
2 " water = 18

Equivalent = 86

When heated, the water is expelled, but it has a great disposition to regain this water, and when it is made into a paste with water it becomes warm, and then a solid uniform mass in a few minutes. It is upon this property of losing water by heat and recombining with it by admixture with a small quantity that its use in taking casts, &c. depends. When sulphate of lime is exposed to a violent heat it melts, and yields an opaque vitreous globule. Sulphate of lime is not only used for taking casts, but occasionally as manure, or rather, probably, as a corrective of certain soils.

Oxalic acid and lime form oxalate of lime. This salt exists in the form of calculi, and also in certain plants. It is readily procured by adding either oxalic acid, or, which is better, oxalate of ammonia to a solution of a salt of lime. It is a white, extremely insoluble substance; it is dissolved by acids, and decomposed at a high temperature, and converted first into carbonate and afterwards pure lime. Oxalic acid and lime form so insoluble a compound, that they are used as tests of each other's presence.

Phosphoric acid and lime form several compounds, one of which occurs in nature. [APATITE.]

There are some other phosphates of lime: the neutral phosphate is prepared by adding a solution of phosphate of soda to one of chloride of calcium. A white powder, insoluble in water, but dissolved by acids, is precipitated. It is composed of

1 Equivalent of phosphoric acid = 36
1 " lime 28

Equivalent = 64

Sesquiphosphate of lime is obtained by mixing a solution of phosphate of lime in phosphoric acid with alcohol. It is a white substance, which reddens litmus paper on account of the excess of acid; this excess is removed by water, and then the neutral phosphate remains. It is composed of

1½ Equivalent of phosphoric acid = 54
1 " lime = 28

Equivalent = 82

Biphosphate of lime is formed by digesting the neutral phosphate in phosphoric acid dissolved in hot water. By due evaporation the salt crystallises in small scales. Its taste is sour, and it attracts moisture from the air. The biphosphate is also obtained when the phosphate of bones is treated with sulphuric acid. It is composed of

2 Equivalents of phosphoric acid = 72
1 " lime = 28

Equivalent = 100

Subphosphate of lime of bones, obtained by calcining them to whiteness, is insoluble in water, but dissolved and partially decomposed by most acids. It is composed of

1½ Equivalent of phosphoric acid = 54
2 " lime = 56

Equivalent = 110

Chlorine and lime act upon each other in a peculiar manner, which is not as yet perfectly understood. When hydrate of lime is exposed to the gas it absorbs nearly one-third of its weight, and the resulting compound has been called a chloride, a chlorite, and a hypochlorite of lime. Although its exact nature has not been determined it is a most important compound, and is used to a great extent for the purposes of bleaching, and frequently called *bleaching powder*. In solution it is employed as a disinfectant. The general properties of the salts of lime are, that those which are neutral and soluble in water are not decomposed by ammonia; but if the solutions be even moderately concentrated, potash and soda throw down lime, and the alkaline carbonates precipitate carbonate of lime. The soluble salts of lime are all precipitated by oxalate of ammonia, unless an excess of acid be present, and then the precipitate is to a certain extent redissolved.

CA'LCULUS is the general term for inorganic concretions of various kinds, formed in various parts of the body, and bearing a general resemblance in shape or composition to stones. The particles of which they are composed are frequently arranged by peculiar chemical affinities into regular forms; and in these, as in other crystals, the process may begin around a fragment of some other substance, such as a clot of blood, a pellet of mucus, or some foreign body, lying loose in the fluid which holds the elements of the calculus in solution. They are also formed by the mechanical aggregation about a nucleus, or otherwise, of particles of different kinds accidentally thrown together, and cemented into a mass by glutinous animal matter: or, lastly, they may be the product of secretion: the more fluid part of the secreted matter being conveyed away or absorbed, while the sediment gradually thickens and hardens into consistence, adhering perhaps to some rough surface or projecting point, or being deposited in a hollow where the accumulation is least liable to be displaced by friction or washed away by the fresh influx of fluid.

Tartar of the Teeth.—The most familiar instance of the last-mentioned kind of concretion is that which is deposited from the saliva and mucus of the mouth between the teeth, and upon their outer surface next the cheek. This affection is not only productive of deformity, but of considerable injury to the teeth, which become loosened by the displacement and absorption of the gums under the increasing pressure of the mass. It may easily be prevented by a little attention in the use of the brush, or remedied by the operation of *scaling*, which gives no pain, and should never be postponed when it is necessary. The substance deposited is gritty, of a dirty yellow colour, and goes by the name of *tartar*, though it has no connection with the vegetable product so called. It is stated to consist of the phosphate and carbonate of lime.

Salivary Concretions.—Similar deposites, consisting nearly of the same materials, occur under the tongue or in the substance of the cheek in the ducts which convey the secretion of the salivary glands into the mouth. They sometimes attain a considerable size, and require an incision for their removal.

Pulmonary Concretions.—Hard irregular masses of phosphate of lime, rarely larger than an almond, are frequently met with in the lungs of consumptive patients. They are sometimes found imbedded in the pulmonary tissue, to which they adhere intimately; but more frequently in the middle of tubercular deposits, especially when these take place in the substance of the bronchial glands. They occasionally find their way by ulceration into the air-tubes, and are brought up by coughing.

Calcareous Concretions in the Blood-vessels and Heart.—Brittle earthy deposites, consisting chiefly of the phosphate of lime, are exceedingly common, especially in advanced life, in the arteries, and in the valves of the left side of the heart, the cavities of which contain arterial blood. They are formed at first in nodules or scales, behind the membrane which lines these parts internally, and sometimes accumulate to such an extent as to convert the arteries into rigid tubes, and to impede or even stop the motions of the heart. They are frequently the cause of *aneurism* and other serious diseases, particularly a kind of mortification of the extremities called *senile gangrene*, and that distressing complaint, *angina pectoris*, which is often found to arise from rigidity of the arteries which supply the heart itself with blood. These concretions are not, however, so often productive of mischief as might be expected; for scarcely an individual passes the middle period of life in whom this ossification of the arteries, as it is termed, does not exist in a greater or less degree. The veins are likewise subject, but much less frequently, to small corpuscular concretions called *phlebolithes* (from φλὲψ, a vein, and λίθος, a stone). They appear to be formed behind the thin lining membrane, which, as they grow, is pushed forward into the calibre of the vessel, enclosing them in a kind of capsule, and forming a narrow pedicle by which they remain adherent. After a time they become detached and moveable. When they occur in the veins upon the surface of the body, they may be removed if troublesome; but they are not in general of any consequence, and are seldom larger than a very small pea. They are quite white, and consist of carbonate and phosphate of lime, combined with much animal matter.

Calcareous deposites are also found occasionally imbedded in the muscles (where however they partake more than in other situations of the fibrous nature of bone), on the surface of the spleen and pleura, in the brain, and other organs, and in various morbid growths of a cancerous, scrophulous, or fungous nature; as well as round foreign substances of any description retained in the body, and subject to the action of its fluids. They do not admit of classification, but all consist of combinations of lime with carbonic or phosphoric acid, and animal matter.

Chalk-stones.—Gouty and rheumatic persons are subject to the deposition of a matter thus denominated, and resembling half-dried mortar, under the skin, about the joints chiefly of the fingers and toes. They have been met with in severe and long-continued rheumatism of the head beneath the skin which covers the cartilage of the ear. They frequently excite ulceration, and when they protrude externally may be removed; but an operation is rarely resorted to. They are found to consist of *urate of soda.*

Intestinal calculi.—The bowels are sometimes obstructed by rounded masses formed by the agglutination of dry fibrous particles, such for instance as the fine down or beard of the oat, which is not entirely removed by sifting the meal. These concretions usually form round a small piece of bone, a plum-stone, or other such body. They are smooth and compact in their structure, but of small specific gravity; the fibrous matter of which they consist occasionally alternates with concentric laminæ of phosphate of lime, which usually forms a layer upon their surface. The circumstances which lead to their formation are obscure, but are possibly connected in some measure with constitutional predisposition, as they are found to recur habitually in the same person in spite of all precautions. The symptoms and most appropriate remedies for this complaint will readily suggest themselves; but its existence is in most cases rather suspected than ascertained till the calculus passes, as the symptoms may arise from other and very different causes of obstruction.

Gall-stones.—Calculi thus denominated are frequently found in the gall-bladder, or reservoir of the bile, which is attached to the liver, especially in persons who have reached the middle period of life, and have been long addicted to luxurious habits, or whose general health has been seriously impaired by mental distress or bodily ailment. They are often numerous, and one instance is recorded in which nearly three thousand were found at once. Generally however there are not more than three or four, and they are often solitary. They consist of one or more of the constituents of bile, with the occasional addition of phosphate of lime, and are white, or of shades intermediate between this lour, brownish yellow, and dark green. The white consist almost wholly of *cholesterine* (from χολὴ, bile, and στερεὸς, solid), a substance like spermaceti, first detected in the bile by Chevreul. The intermediate shades are composed of this substance, with more or less admixture of bile; and the darker kind seem to consist entirely of bile itself inspissated. The last are rough and friable in their texture, sometimes much resembling cinders; the lighter varieties, on the contrary, are smooth and unctuous to the touch, presenting several surfaces apparently flattened by mutual pressure. They are moreover distinctly crystalline, and sometimes lamellated as if deposited in successive layers.

Biliary calculi are not productive of much inconvenience as long as they remain in the gall-bladder; but when they are protruded through the proper duct of that organ into the canal by which the bile passes from the liver into the intestine called the duodenum, they occasion great pain and disturbance of the health. The pain occurs in paroxysms, and is seated in the pit of the stomach, or a little lower and to the right, shooting to the back; and it is generally attended with vomiting and shivering, but not at first with a quickened pulse. If the bile be wholly obstructed, the evacuations lose their colour, and become unfrequent; the skin is tinged with a deep yellow, or *jaundiced*, as it is termed; rapid emaciation succeeds, with fever, and extreme dejection and weakness. The event is sometimes fatal, but in general the stone passes at length into the duodenum, the flow of bile is re-established, and the disturbance subsides. The best remedies are emetics, aperients, *opium*, the warm bath and fomentations, and occasionally bleeding.

Urinary Calculi.—The urine is a very complex fluid, holding in solution at least twelve different ingredients in health, and more in disease. Some belong to the class of acids, as the uric, phosphoric, and oxalic; others are alkaline or earthy, as ammonia, soda, lime and magnesia. In certain conditions of the system these elements are no longer kept in complete solution, but are precipitated or combined in a solid form, constituting various kinds of crystalline or sedimentary deposites often arranged in successive layers; thus inducing those well-known affections, *gravel* and *stone in the bladder.*

Renal calculus and gravel.—Urinary concretions for the most part originate in the *pelvis* or hollow part of the kidney, either as small stones or in the form of minute sand-like crystals. In this situation they are called *renal* calculi (from *ren*, the kidney). They may remain there permanently, and even attain a considerable size, so as to distend the cavity and cause absorption of the gland itself, without more inconvenience than an occasional sense of weight and a dull aching in the loins. They may also produce inflammation and abscess of the kidney, which sometimes ends in the discharge of the stone with the other contents of the abscess through an ulcerated opening in the back, and sometimes in a lingering death. More commonly the deposite is carried with the urine while yet of small size or in the form of sand into the *ureter* or duct of the kidney, along which it descends more or less slowly into the bladder with symptoms much resembling those which attend the passing of a gall-stone. These are shivering, sickness of the stomach, pain shooting in paroxysms from the back to the groin, and down the thigh of the same side; and, in males, retraction of the corresponding testicle. The circulation does not partake in the disturbance unless the calculus be so large as to obstruct the ureter, and thereby excite inflammation of the kidney. These symptoms constitute what is called *a fit of the gravel*, and generally terminate in the expulsion of the offending matter with the urine, which is not effected without much pain in the neck of the bladder and the urethra; the urine being voided in small quantities and with difficulty, and occasionally mixed with blood. The remedies employed in gall-stone afford relief in a fit of gravel. Copious draughts of some mild warm fluid should also be taken, with small doses of alkaline or other medicines, suited to the nature of the deposite.

Vesical calculi.—It sometimes happens that a renal calculus, having reached the bladder in the manner described, is detained there and becomes the nucleus of fresh concretions. A vesical calculus may also be formed upon a foreign body, such as the broken end of a catheter, or upon a small stone which has made its way inwards. Nuclei of this last kind are formed originally in the ducts of the prostate gland, which surrounds the male urethra just where it issues from the bladder, and consist of phosphate of lime.

In whatever way it may first arise, *vesical calculus* or *stone in the bladder* is one of the most dreadful maladies to which man is exposed. Even in its nascent state, but most certainly when it becomes at all large, the stone occasions excruciating pain. This is seated chiefly in the neck of the bladder where the stone usually rests, and, by sympathy, in the urethra near its external orifice: it is attributable, in a great measure, to the strong spasmodic contractions of the bladder upon the stone, and is most severe immediately after micturition. Hence, fortunately, it is intermitting: for when the bladder is full, the weight of the stone is partly sustained by the fluid, and it does not touch the sensitive internal membrane in so many points. In some cases the pain is more endurable than in others from peculiarity of constitution, or the comparative smoothness and lightness of the stone; but sooner or later the period of agony arrives; the bladder becomes intolerant of the smallest amount of distension, so that the urine is voided, as it enters, drop by drop, mingled with blood and mucus; and at length the patient inevitably dies, worn out by unremitted suffering.

There are remedies which are capable of affording a certain amount of relief for a time; but the only means that offer even a chance of a happier termination than death itself, are the removal of the cause by an operation. The stone must either be withdrawn through the urethra by a properly constructed instrument, which often succeeds when it is small in the male, and seldom fails in the female unless it be large; or it must be drilled and crushed into fragments small enough to be voided with the urine, according to a brilliant method of operating lately brought into notice [LITHOTRITY], or an incision must be made large enough to permit its extraction [LITHOTOMY]; a method practised by the antients, and unfortunately by no means superseded (as some imagine) by lithotrity, which is out of the question in very young children, and often inapplicable in more advanced life. This disease is curable by the various means that have been devised, or a combination of them, in perhaps five or six out of seven cases, even in its advanced stage; and the average number of failures in young children does not amount to one in fourteen. It is always advisable that an operation should not be delayed when the existence of stone is proved, which, it may be observed, can only be done by actually striking it audibly with a metallic instrument called a *sound;* for not only is the stone constantly increasing in size, but the parts concerned may become incurably diseased in consequence of delay, or the general health may sink beyond the power of restoration. The idea of dissolving the calculus is a dream.

It is a curious fact in the history of this disease, that exceedingly common in some places and very rare in ot Thus at Norwich and Paisley together, there are prob more cases in a year than in the whole of London; while at Hereford the disease is almost unknown. No researches into the cause of this difference have yet afforded a satisfactory explanation of it.

It would be tedious to enter at length into the chemical nature of urinary calculi. In weight they vary from a few grains even to several pounds, but seldom exceed a few ounces. They have been distinguished (chiefly by the labours of Dr. Wollaston) into the following kinds, which are here arranged nearly in the order of their frequency:—

1. Uric acid.
2. Oxalate of lime, called also the *mulberry* calculus, from its dark colour and rough surface.
3. Ammoniaco-magnesian-phosphate; called also the triple-phosphate.
4. Phosphate of lime, or bone earth calculus.
5. The fusible calculus, a combination of the last two species; so called from its fusibility under the blow-pipe.
6. The mixed calculus; composed of several of the other kinds confusedly mixed.
7. Urate of ammonia.
8. Carbonate of lime.
9. Cystic oxide.
10. Xanthic oxide.

The three last are extremely rare. The phosphatic varieties generally include a nucleus of the first or second species, and are found chiefly in advanced life, or in cases of long standing.

The substance called uric acid, of which probably three fourths of the concretions in question consist wholly or in part, is sparingly soluble in water unless an alkali be present in a quantity more than sufficient to neutralize it; and from such a solution, of which healthy urine is an example, the addition of almost any other acid will precipitate either the urate of the alkali, or the uric acid itself in the form of powder. To this peculiarity is probably due the formation of chalkstones—consisting, as we have seen, of urate of soda—in those who are subject to gout, as well as the proverbial liability of such persons to gravel and other calculous disorders; for in this complaint acetic aid is so abundantly generated as to be observable in the perspiration. Children also, in whom the food is so apt to turn sour upon the stomach, are much more liable to stone than the middle-aged, and their calculi almost invariably consist of uric acid. In such cases the alkalies and absorbent earths are of eminent service, by preventing the admixture of free acid in the urine, which is thus rendered more capable of retaining the urates in solution. These medicines, on the other hand, are extremely injurious if the phosphates happen to prevail, when acids should take their place, for reasons somewhat analogous. These considerations may have their use in pointing out the propriety of attending to the diet and the digestive functions, with a view to prevent or correct the formation of urinary concretions; and they no less forcibly illustrate the necessity of a knowledge of chemistry on the part of those who are intrusted with the treatment of such disorders, that the different kinds may be justly discriminated. This can only be done by a careful analysis of the urine and its sediments; a process which will be explained in the article on URINE.

CALCULI IN INFERIOR ANIMALS.—[illegible]ary *calculi* are rare in the horse and the deer, for [illegible] animals have no gall-bladder, and the hepatic duct is large and straight, and the bile flows through it as fast as it is secreted. They are often found in the gall-bladder of the ox, sheep, and dog. There is scarcely a stall-fed ox slaughtered from Michaelmas to Lady-day in which they do not exist of large size, or in great numbers: sometimes there is only one concretion, but that of considerable magnitude. In an ox that died of jaundice, a gall-stone was found which weighed 15 oz. when first removed from the bladder. More frequently there are numerous calculi of a small size, scarcely larger than grains of sand, or many of them agglomerated together, forming a rounded or irregular body, from the size of a pin's head to that of a millet seed. More than 800 have been counted in the gall-bladder of one beast. Occasionally there is found an irregular crystallized body of a green or azure blue colour, glistening and polished. This forms a valuable pigment. The cause of these concretions is not well understood, but it depends greatly on want of exercise and impaired digestion. In the grass-fed ox they are seldom found. These calculi may exist in the gall-bladder without apparent injury to the health, but occasionally they press upon and close the passage through which the gall should be conveyed to the intestinal canal; or they enter into the hepatic duct and obstruct it, and prevent the flow of the bile through it; or, being numerous and large, they may, by their presence and weight and friction, irritate the mucous membrane of the cyst, and thus be productive of disease. [Bile, Digestion, and Jaundice.] If the existence of inspissated bile, or biliary calculi, in the gall-bladder were indicated by a certain train of symptoms, the experience of the farmer would supply a ready and almost certain cure. The stall-fed ox has the gall-bladder partially filled with minute or larger concretions. The grass-fed beast in June will rarely furnish one. The former was idle and over fed; the latter was compelled to exert himself a little in order to obtain his food, and he was kept under the salutary aperient influence of the newly-sprung grass.

Biliary calculi have been observed in the gall-bladder of almost every domestic quadruped, and very often in poultry. They differ materially in their composition, but agree in being crystallized bodies, formed of layer upon layer, and containing margaritic acid, animal mucus, a yellow colouring matter, and salts, principally phosphate of lime and magnesia.

Cerebral Calculi have been found more frequently in the horse than in any other quadruped. They are contained in the ventricles of the cerebrum or the cerebellum, and attached to or enveloped by the plexus choroides. They are usually white, variously formed, of a stony hardness, and consist nearly of pure phosphate of lime. No peculiar symptom indicates the existence of the calculus, but the horse is suddenly attacked by inflammation of the brain and dies; upon examination the ventricles are found distended with fluid, and these concretions attached to the plexus of vessels. Afterwards, perhaps, it is recollected that the animal had been somewhat dull and stupid, sleepy, and self-willed, and had frequently hung his head; that, in fact, there had been something wrong about the head. The irritation produced by the foreign body had been long existing and increasing.

Gastric Calculi are rarely or never found in the stomach of the horse; but they are of frequent occurrence in ruminants. Concretions varying from the weight of a few ounces to seven or eight pounds have been found in the paunch of cattle. There are traces of concentric layers in all of them, but they are far from being regular. There is usually some central nucleus, such as a small bit of nail or stone, around which has been collected a mass of earth and food and hair, cemented by the mucus of the stomach. When loose in the rumen, they acquire a globular form, but, having been confined in one of the compartments of that viscus, they are occasionally flattened, and in a few cases angular. The symptoms by which their presence is indicated are not well known, nor the effects which they produce; but one thing of some importance is certain, namely, that they are seldom found in healthy and thriving cattle. They may be either the cause or the consequence of disease, and much may be said on both sides. The method by which they may be dissolved or otherwise got rid of is unknown. A different kind of concretion is found in the abomasum or fourth stomach [illegible], and particularly of calves. It is composed almost [illegible] of hair, agglutinated by the mucus of the stomach. [illegible] are frequently observed to spend a considerable time in the friendly office of licking each other; a portion of the hair mixed with the saliva is occasionally swallowed; and, not possessing sufficient solidity or weight to break through the roof of the paunch and enter that stomach, it passes along the œsophagean canal to the fourth stomach, where, by the peristaltic motion of that stomach, it is formed into a ball. There are no symptoms which clearly indicate the presence of these balls, nor is it plain by what means they could be expelled; but it is very evident that they have an injurious effect, producing distension of the paunch and loss of digestive power in the fourth stomach; the first by sympathy, and the latter by their direct presence. The animals in which these hair-balls are found after death were never well conditioned or healthy, and those that have expelled a hair-ball by stool have immediately begun to thrive.

Similar balls, but composed of felted wool with portions of different kinds of food and various earthy and saline matters, mixed up with the mucus of the stomach, and having undergone a process of crystallization, are found in the fourth stomach of the sheep, the goat, the chamois, the antelope, and the deer. They have usually a small nucleus, but the structure of the surrounding mass and the form of the whole admit of much variety. [Bezoars.]

Intestinal Calculi are often found in the horse. They have almost invariably some central nucleus, as a seed, a small stone, or a bit of nail, around which particles of food and saline matters have accumulated and crystallized. They differ from the gastric calculi in the greater portion of earthy and saline matter of which they are composed, and scarcely a trace of food is detected in many of them. The concentric layers are well defined, and the ball, when dried, will bear a beautiful polish. They assume different forms according to the portion of intestine which they occupy. In the colon they adapt themselves to the shape of the cells of that viscus, and represent a kind of four-sided prism: at the fundus, or base of the cæcum, they are globular. Twenty or thirty of the cells of the colon will sometimes be occupied by them, varying in weight from half an ounce to three-quarters of a pound. In the cæcum, a single concretion has occasionally weighed eight or ten pounds.

They are oftenest found in heavy horses of slow work. Mill-horses are also subject to them, and horses that are fed on much dry bran. The symptoms of their existence are obscure, and can scarcely be distinguished from those of colic. They have occasionally been expelled in the act of purging, but it would generally be a fruitless and a dangerous attempt to dislodge them, for they are embedded in the cells of the colon or the blind pouch of the cæcum. They destroy the horse by the irritation which they occasion, and by their weight, and especially in the concussion of rapid action, they rupture the parietes of the intestine. It would seem almost incredible that they should remain so long as those of larger size must necessarily do. Many months or years must have passed away in the formation of a calculus that ultimately weighs eight pounds. There is scarcely a case in which they have occasioned the death of the animal, where careful inquiry will not elucidate the fact that during a very long time the animal had experienced occasional attacks of apparent colic.

Salivary Calculi are oftener found in the herbivorous animal than in the human being, because there is a greater expenditure of saliva in mastication, and the salivary glands are larger and more susceptible of inflammation. They mostly exist in the parotid duct. They are of a dead-white colour, usually of an oblong form, of considerable density and specific gravity, and the surfaces highly polished or capable of being so. They are only injurious when they completely obstruct the duct; then the salivary fluid, continuing to be secreted, accumulates behind the calculus, and the canal becomes distended, and will burst, unless an incision is made upon the calculus, and the obstructing body removed.

The salivary calculus of the horse consists of 86 parts of carbonate of lime, 6 of animal matter, 4 of water, 3 of phosphate of lime and other salts, and 1 of mucous matter.

Urinary Calculi. These, whether found in the kidneys, or ureters, or bladder, or urethra, have been observed in almost every domesticated animal. In the horse, a urinary calculus has occupied the whole cavity of the kidney and has weighed more than a pound. It has obstructed the ureters, and destroyed the horse and the ox: it has completely filled the bladder of the dog, and has been shivered into a thousand pieces by the sudden fall of the animal from a considerable height. In the urethra also it has been productive of fatal inflammation in the dog. In almost every animal sand has occasionally occupied the fundus of the bladder. Minute calculi have been found in almost countless numbers, or one large calculus has produced extreme pain, suppression of urine, and destructive inflammation. In most of these cases means have been found to allay to a certain degree the irritability of the bladder, but no medicine has the slightest solvent power on the calculus. The operation of lithotomy has been performed with success on almost every domesticated quadruped, and that of lithotrity has been effectual in the horse.

Nearly the same constituent principles enter into the composition of these calculi in the herbivorous animals. The carbonate of lime prevails: there are, on an average, 83 parts out of 100 of it in the urinary calculus of the horse; 87 in that of the ox, and 91 in that of the ass; the remainder is made up of subphosphate of lime and animal cement. In the hog, however, ammoniacal phosphate of magnesia is, with the animal cement, nearly the sole material. In none of them has uric acid been detected.

The concretions which are found in other tissues and organs differ little from those in the human being.

CA'LCULUS, CALCULATION. The word *calculus* means a small pebble, such as was made use of in teaching or practising *calculation*. We must refer to articles of a more specific kind for different methods of calculation, but as regards this individual word, we have only to draw the distinction between it and *mathematics*. Generally speaking, a calculator is taken for a mathematician; which he may or may not be. Mathematicians are sometimes fond of and skilful in calculation, and sometimes the reverse of both: Euler and Wallis are instances of the former; Lagrange, according to report, of the latter. To perform a calculation is to put numbers together by rules, the reasons of which may or may not be understood by him who uses them. It is true that a mathematician must, in the process by which he becomes such, increase his power of calculation; but whether he will ever attain the expertness and correctness of a banker's clerk in the commonest operation depends upon qualities of mind which have little or nothing to do with his *mathematical* power. It is necessary to caution our readers not to take a result as *mathematically* correct, because it is produced by a skilful calculator; or as *numerically* correct, because it has been worked by a good mathematician. The method of the first, and the work of the second, may be wrong without any inference against either in relation to his peculiar pursuit.

The term *calculus* is commonly applied to signify any branch of mathematics which may involve or lead to calculation: any, in fact, except pure geometry. Thus the part of algebra which relates to exponents and logarithms is sometimes called the exponential *calculus*. The references immediately following are to those branches which, without any particular reason, have permanently acquired the name of *calculi*. And, the word being now completely introduced, every new specific development of any part of mathematics will receive the name. Thus the calculus of definite integrals, the calculus of discontinuous functions, &c., are terms which are beginning to be used.

CALCULUS, DIFFERENTIAL. [DIFFERENTIAL CALCULUS.]

CALCULUS, INTEGRAL. [INTEGRAL CALCULUS.]

CALCULUS OF VARIATIONS. [VARIATIONS, CALCULUS OF.]

CALCULUS OF FUNCTIONS. [FUNCTIONS, CALCULUS OF.]

CALCUTTA, the capital city of Bengal, and the seat of the supreme government in British India, is situated on the left or east side of the Hoogly, in 22° 23′ N. lat., and 88° 28′ E. long.; about 100 miles from the sea.

In the beginning of the last century Calcutta was only an insignificant village, inhabited by native husbandmen; and a great part of its present site was completely covered with jungle. The spot appears to have been ill chosen as regards salubrity. The proximity of the low, damp, and dreary region of the Sunderbunds, a woody tract containing eight mouths of the Ganges, is necessarily unfavourable in this respect; and the healthiness of the city is still further impaired by a dense forest on the east, and some extensive muddy lakes on the south. The English have done something to [illegible] this evil by properly draining off the surface-water near the town, and by filling up several stagnant ponds, as well as by clearing away the surrounding jungle to a considerable extent, but the air is still considered far from healthy.

In 1698 the English factory was removed from Hoogly to this spot, then occupied by the village of Govindpore, but the progress of the city was at first so slow that in 1756 there were not more than 70 houses in it occupied by Europeans. An attempt had been made in 1742 to defend the place from the incursions of the Maharattas by surrounding it with a ditch, a precaution which availed but little against the attack in June, 1756, by Suraja ud Dowlah, the soubahdar or viceroy of Bengal. On the occasion of this attack the factory was deserted by the governor, the commandant, and many other of the European functionaries and residents. On the capture of the place, the English who had remained to defend the factory were thrust into a small unwholesome dungeon called the Black Hole, and of 146 individuals who were thus shut up at night only 23 were found alive in the morning. In the beginning of the following year, a squadron consisting of five ships of war, accompanied by 2400 troops under the command of Colonel Clive, arrived in the Ganges from Madras, and re-took the town of Calcutta, from which the garrison of the soubahdar retired, after an attack of only two hours' duration.

The citadel, to which the name of Fort William was given, was constructed by Clive soon after the battle of Plassey, fought in June, 1757. This fort stands on the bank of the Hoogly, about a quarter of a mile below the city. Its form is octagonal; five of the sides, which are towards the land, are regular, and three, which front the river, have their lines varied according to local circumstances. Fort William is the most regularly constructed fortress in India. The works are low, and there are but few buildings within the walls, which are so extensive, that it is said 10,000 men would be required to man them properly in case of attack; it is computed to have cost in its construction altogether two millions sterling. Its principal batteries are towards the river, from which side only an attack is to be apprehended.

The space between the fort and the city, called the Esplanade, contains the government-house, built by the Marquess Wellesley, which is the finest building in Calcutta: it consists of a centre with four wings, one at each corner, connected together by circular passages. The centre building contains two very fine rooms. The lower of these, the hall, is paved with marble, and supported by Doric columns; over this is the ball-room, supported by Ionic pillars. The private apartments, the council-room and other offices are contained in the wings. On a line with this building is a range of magnificent dwelling-houses with spacious verandahs.

The town extends for four miles and a half in the direction of the river; it varies in breadth considerably in different parts, the average being one mile and a half. The parts in which Europeans reside are mostly occupied by handsome detached houses, built of brick and stuccoed with lime, which gives them the appearance of marble palaces. The principal square measures 1500 feet on each side, and in the middle has a large tank, from which the square takes its name. This tank, which is 60 feet deep, is surrounded by a wall and balustrade, and has steps on the inside reaching to the bottom. During the administration of Lord Hastings large sums were expended in improving the ventilation of Calcutta; a street sixty feet wide was opened through the centre in its longest diameter, and several squares were made, which, like the one already described, have each a tank in the middle surrounded by planted walks. A quay, called the Strand, between two and three miles long, was formed, which extends upon the river-bank along the city. This quay is forty feet above low-water mark, and is furnished with many ghauts, or broad flights of steps, which are useful for the landing of goods, and for the accommodation of the natives in making the frequent ablutions prescribed by their religion.

The principal public buildings, besides the government-house, are the town-hall, the courts of justice, two churches for Episcopalian Protestants, and one for Scotch Presbyterians, besides Catholic chapels, a Greek and an Armenian church, several Hindu pagodas and Mohammedan mosques, and a Seik temple. On the south side of the town are an hospital and a gaol. The quarter in which the natives principally reside is to the north, and consists of narrow dirty, unpaved streets: this quarter offers a complete contrast to the parts occupied by Europeans. There are a few brick houses of two stories, with flat terraced roofs, in this part, which is called the Black Town, but the far greater part of the dwellings are mud hovels, covered with small tiles, the walls frequently consisting of mats and bamboos, from which circumstance fires are of frequent occurrence. This quarter swarms with population. The total number of inhabitants in the city and suburbs has been estimated at 625,000. In 1819 the School Society reckoned the native population alone at 750,000, but as the limits comprehended in their computations were not defined, it is not possible to come to any certain result on the subject. So long ago as 1802 an opinion was expressed by the police magistrates, that, including with Calcutta a circuit of twenty miles, the number of inhabitants amounted to 2,225,000 souls. This number is probably wide of the truth; but there can be no doubt that the whole of the district comprehended within the described limit is very densely peopled. About one-third of the native inhabitants of Calcutta are Mohammedans, and nearly all the remainder are Hindus. The number of Christians was stated in 1822 to be 13,138, since which time that part of the population has probably increased. There are besides a few Chinese, Armenians, and professors of other systems of faith which prevail in different parts of the continent of India.

With so large a population, Calcutta presents at all times an animated scene. It was ascertained a few years ago, by means of persons stationed in various quarters for the purpose, that the number who daily enter the city from the suburbs and from the opposite side of the river amounts to upwards of 100,000 persons. The great mass of the population speak the Bengali language; and many, including the servants attending upon Europeans, speak the Hindustannee also.

The botanic garden, a splendid establishment of the East India Company, is situated on the west side of the Hoogly, where that river takes a bend, to which the name of Garden Reach has been given. Above this garden is an extensive plantation of teak, which wood does not occur naturally in this part of India. The introduction of this species of tree is considered desirable, as ship-building forms an important branch of industry. On the west bank of the river, both above and below as well as opposite to the city, there are several private yards for that purpose.

The soil in and about Calcutta is so deficient in water, that, after boring to the depth of 110 feet, no springs have been found. Many trunks of trees have been discovered 60 feet under the surface, standing erect, with their roots and branches perfect. Thin strata of coal and blue clay have been met with between 50 and 60 feet below the surface.

The external trade of the province of Bengal being almost wholly carried on at Calcutta, its nature and amount have been given in our description of the province [Bengal]. The river is a full mile wide at high water, and trading vessels of the largest size ascend as high as the town.

The attention of strangers is much excited on first visiting Calcutta, by the number of vultures, kites, crows, and a species of crane, which, from its stately walk, has received the name of Adjutant [Adjutant]. These birds clear away the surplus food provided for Europeans, which is thrown at night into the streets, as it cannot be kept in that climate, and there are few poor persons to consume it whose religious prejudices will allow of their doing so. These scavengers are assisted by numerous foxes, jackals, and wild dogs, who enter the city at night for the purpose from the neighbouring jungles, and whose mingled howlings produce a very unpleasing effect.

The markets are abundantly supplied with game, meat, fish, vegetables, and fruits, the whole of which are sold at moderate prices. The game consists of wild-ducks, teal, ortolans, snipes, hares, and venison. Among the fish is one—the mango fish—which is described as a great luxury: it has derived its name from the fact of its appearing in the river only at the season when the mangoes ripen. Fruits are furnished in an infinite variety, and of delicious flavour; pine-apples, melons, mangoes, oranges, guavas, peaches, loquats, and strawberries, are among the more usual descriptions.

The European inhabitants have established several institutions for literary, scientific, and educational objects. The Asiatic Society, formed by Sir William Jones, was founded at Calcutta in 1784 [Asiatic Society]. Among the institutions for promoting education are the college of Fort William, a government establishment for the instruction of young men who have been partially educated in the college at Hailybury. A Sanscrit college, a Mohammedan college, and an Anglo-Indian college, are likewise supported by the government, which also gives assistance to many private institutions for instructing the children of natives and of the poorer classes of Europeans. The residents of Calcutta support a variety of charitable institutions and of societies for religious objects.

Calcutta is the seat of the supreme court of judicature for the presidency of Bengal. This court is under the control of a chief justice and two puisne judges appointed by the king. The courts of Sudder Dewanny Adawlut, and Nizamut Adawlut, established in Calcutta, the first for civil, the last for criminal causes, are courts of appeal from the provincial courts in all parts of India.

In 1814 a bishop's see was erected within the Company's dominions in India; the bishop, under the title of Bishop of Calcutta, has his residence in that city: his salary was fixed by act of parliament at 5000*l.* per annum.

The travelling distances measured in English miles from Calcutta to several of the chief places in India are as follows:—Agra, 839; Allahabad, 544; Ahmedabad, 1234; Amednuggur, 1119; Aracan, 475; Arcot, 1070: Ava, 1150; Bahar, 297; Balasore, 141; Baroach, 1220; Bareilly, 805; Bednore, 1290; Benares, 460: Bombay, 1301; Buxar, 408; Cabul, 1761; Candahar, 1781; Cheitore, 1063; Comorin Cape, 1470; Dacca, 177; Delhi, 956; Ganjam, 369; Gualior, 805: Hydrabad, 902; Juggernauth, 311; Lahore, 1342; Lucknow, 649; Madras, 1030; Mirzapore, 493; Monghir, 275; Mooltan, 1450: Moorshedabad, 118; Mysore, 1178; Nagpore, 722; Nagpore (Little), 280; Oude, 562; Patna, 340; Pondicherry, 1130; Poonah, 1208; Seringapatam, 1170; Silhet, 325; Sumbhulpore, 438; Surat, 1238; Tanjore, 1235; Trichinopoly, 1238; and Vizagapatam, 557.

(Rennell's *Memoir of a Map of Hindustan*; Mill's *History of British India*; Tennant's *Indian Recreations*; *Reports of Committees of House of Commons on the Affairs of India*, 1831 and 1832.)

CALDARA. [Caravaggio.]

CALDA'RIUM. [Bath.]

CALDER, one of the rivers of Yorkshire, rises in the high grounds on the borders of Lancashire, in a marsh in Chviger Dean, S.E. of Burnley: and from the same marsh rises a branch of the West Calder, which runs in an opposite direction, and joins the Ribble. The course of the Yorkshire Calder is easterly, through the deep valley of Todmorden; at Sowerby the river passes within two miles of Halifax, and by Dewsbury and Wakefield, at which latter place it is crossed by a bridge of nine arches. From Wakefield the course of the Calder is nearly N.E. to Castleford, near Pontefract, where it joins the Aire, which enters the Ouse five miles from Snaith. At Sowerby, about three miles S.W. of Halifax, the Calder receives a considerable brook from Ripponden, five and a half miles S.W. of Halifax. A little below Salterhebble, about two miles S.W. of Halifax, its volume is increased by the Hebble, a small but rapid stream, which rises above Ovenden, and passes round the north and east sides of the town of Halifax; and a few miles farther on the Calder receives the river Colne, which rises near Holm Moss, and runs past Huddersfield.

The Calder is an important feature in the canal system of Yorkshire and Lancashire, and forms part of a line of internal navigation between the eastern and western coasts. The Rochdale canal, thirty-one miles and a half in length, commences in the Calder and Hebble navigation at Sowerby bridge wharf, and terminates by a junction with the Bridgewater canal at Manchester. The Calder and Hebble navigation is twenty-two miles long, from its junction with the Aire and Calder navigation, about a quarter of a mile from Wakefield, to the basin at Sowerby bridge, in which it terminates. The Calder forms a considerable portion of the line, except where cuts are made to avoid the circuitous course of the river. There is a branch to Halifax. The Barnsley canal, fifteen miles long, commences in the lower part of the Calder, near Wakefield, and joining the Dearne and Dove canal, nine miles long, which terminates in the river Dun navigation, opens a communication with Sheffield and Rotherham. The Ramsden canal, four miles long, commences in the Calder and Hebble navigation, and terminates at Huddersfield, from which a line of canal, nine-miles and a half in length, called the Manchester, ton, and Oldham canal, extends to Duckenfield in the parish of Ashton-under-Lyne, near which place it is joined by the Peak Forest canal. The canals of Lancashire and the West-Riding of Yorkshire are connected with the Ouse by the Aire and Calder navigation, which includes the Selby canal, and the new canal from Ferrybridge to Goole. In 1625 an attempt was made to obtain an Act 'for the making and maintaining the rivers Ayre and Cawldes,' but no Act was passed before 1699. At this latter date the cloth goods manufactured at Wakefield and Leeds were conveyed twenty-two miles by land carriage to Rawcliffe, within two miles of the Ouse; Halifax was thirty from all water communication, and Rochdale forty miles. The clothiers of Leeds and Wakefield, in a petition presented to the House of Commons in favour of the bill, complained heavily of the difficulty of transporting their manufactures: 'the expense whereof,' they state, 'is not only very chargeable, but they are forced to stay two months sometimes while the roads are passable to market, and many times the goods receive considerable damage, through the badness of roads, by overturning.' Another Act was obtained in 1774, under which further improvements were effected in the two rivers; and within the present century the Aire and Calder navigation has been rendered one of the most efficient lines of water communication in the kingdom. The Aire is not navigable above Leeds, which town is thirty miles above the junction of the Aire with the Ouse, and twelve above the junction of the Aire and Calder. A little above Leeds bridge the Leeds and Liverpool canal locks down into the Aire. The branch of the Aire and Calder navigation to Wakefield is twelve and a half miles in length from the junction of the two rivers at Castleford; and with the Calder and Hebble navigation and Rochdale canal forms the line of communication with south Lancashire, while the Leeds and Liverpool canal is carried through the middle and western parts of that county, and terminates at Liverpool. At Haddlesey, four and a half miles from the Ouse, the Aire and Calder navigation has a branch to Selby, which facilitates the interchange of commodities between Leeds and Wakefield and the populous districts to the West, and the agricultural districts of the East and North Ridings of Yorkshire. In 1820 the undertakers of the Aire and Calder navigation obtained an Act, under which a fine canal, sixty feet wide at top, and eighteen and a half miles in length, has been formed from Ferrybridge to Goole. At Goole, which was previously a small hamlet, capacious docks have been constructed, and a custom-house established, so that goods can be shipped hence to foreign parts.

In 1828 further improvements were commenced in the Aire and Calder navigation, by which vessels of 100 tons burthen can go to Leeds and Wakefield. Additional cuts have also been made in order to avoid the circuitous course of the river, and the line has by this means been rendered several miles shorter. Goods which leave Leeds and Wakefield in the evening by the fly-boats arrive at Goole in eight hours, where they can be at once put on board steam-boats for Hamburgh, London, and other places. Steam-boats for passengers are employed on this navigation.

(Priestley on *Canals*; 'Physical and Political Geography of the British Islands,' in the *Library of Useful Knowledge*.)

CALDER, a river of Scotland, called the Calder Water, runs into the Clyde five miles above Glasgow.

CALDERON DE LA BARCA, DON PEDRO, a great Spanish dramatist, born of noble parents at Madrid, in 1601, suggests a striking parallel with Lope de Vega, his celebrated countryman and forerunner in the same career. Both were wonderfully precocious: Lope wrote plays at the age of 11 or 12, and Calderon exhibited no inferior genius at 13, in his 'Carro del Cielo' (the Heavenly Chariot). Both devoted the vigour of life to the military profession, and their maturity to the ecclesiastical order; and the poetic talents of both continued to advanced age. Both of them acquired reputation and even affluence from a gift proverbially doomed to penury and at the most hardly promising more than posthumous renown[*].

Lope and Calderon gave the law to the Spanish theatre. They exhibit all the irregularity of Shakspeare, his ... mity, and his absurdity, with his flashes of genius, and his truth to nature; thus frequently redeeming their numerous faults, and making amends for many to us now very ridiculous scenes. The fertility of these two writers is not the least surprising part of their history. Lope added 2000, and Calderon 500 pieces at least to the national dramatic stock. Their success could not fail to call forth numerous imitators at home and abroad, and to prepare the way for a more correct class of writers, such as Corneille[†], Molière[‡], &c.: the French translations by Linguet[§] doubtless contributed largely to produce this effect.

But while Lope, under Philip II. and Philip III., both of whom were averse to the stage, had to minister to the fanciful and extravagant taste of the crowds to whom alone he could look for support and success till Philip IV.'s accession in the year 1621,—Calderon, more fortunate, enjoyed early in life the patronage both of the multitude and of the reflecting few, by coming later under a prince who was fond of theatrical amusements, and himself supposed to be the author of certain pieces bearing the title of 'Comedias de un Ingenio de esta Corte' (Plays written by a Wit of this Court).

Calderon's talents, which had been early manifested at school under the Jesuits, developed at Salamanca, and already admired in the Spanish possessions of Italy and the Low Countries, were at last encouraged by the patronage of Philip IV. Philip, who was anxious to increase the éclat of his court, and to set the first-rate wits to work for the purpose, bestowed on Calderon a knighthood of Santiago in 1636; invited him to Madrid in 1640 to write the 'Certamen de Amor y Zelos' (the Contest between Love and Jealousy), a sort of festival to be performed on the lake of Buen-Retiro; and soon raised his allowance to an *escudo* more per day. Subsequently, in 1649, he intrusted to his taste and ingenuity the plan and directions of some triumphal arches, under which the royal bride Mary Anna of Austria was to pass.

At the age of 50 Calderon entered the church, and, two years afterwards, the king bestowed on him a chaplaincy of Toledo. In 1663 he gave him another similar piece of preferment, with a handsome pension charged on the revenue of Sicily, and other similar acknowledgments of his services and merits. During the long period of thirty-seven years he wrote, by special commission of the municipality of Madrid, and of other cities, such as Toledo, Sevilla, and Granada, about 100 'Autos Sacramentales,' or sacred pieces, which resemble those of the 16th century, commonly called 'Mysteries.' The Autos of Calderon soon superseded those of all previous Spanish authors; and to their composition the poet devoted the remaining 30 years of his life after he had entered the ecclesiastical profession. In his 80th year he wrote his 'Hado y Divisa.' As the booksellers were now selling spurious works under his name, he was urged by the duke of Veraguas to make a true list of all his works, but he merely sent a list of his Autos, expressing, on religious grounds, very little concern for the rest.

Some of the Autos of Calderon, especially that entitled 'La Devocion de la Cruz' (the Devotion of the Cross, meaning its miracles), are the best productions of the kind. Augustus Schlegel has translated it, with some others of the best of his dramas, such as 'El Principe constante,' a tragedy which might be called the Lusitanian Regulus for its Portuguese lofty subject. It is indeed Calderon's masterpiece, and displays the full lustre of his genius. He wrote also a poem in octaves on the *novisimos* or *postrimerias* (the old scholastic and ascetic collective denomination of death, judgment, heaven, and hell). There is also among his works a discourse on painting, 'La Nobleza de la Pintura;' another in vindication of the stage, 'Defensa de la Comedia;' and many songs, sonnets, and ballads, with numerous short poems to which the highest prizes were adjudged on various occasions.

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[*] Lope, in one of his letters, dissuades his son from poetry as unprofitable, although he was then already living in splendour in the very same street in which Cervantes was actually starving. Cervantes, however, has been the delight of Europe for two long centuries, while the former, notwithstanding a mod[illegible] of his works in 22 volumes, is comparatively neglected, even by his countrymen. (Pellicer's *Life of Cervantes*, and Lord Holland's *Account of Lope de Vega*.)

[†] After a long controversy, it is believed that Corneille formed his Heraclius upon the play of Calderon, as most undoubtedly he took his Cid and his Menteur from Guillermo de Castro.

[‡] Molière's 'Femmes savantes' was suggested by Calderon's 'No hai burlas con el Amor' (Love is no Joke); and Scarron, who spoiled everything, grossly disfigured, under the title of 'La fausse Apparence,' Calderon's 'Nunca lo peor es cierto' (The worst is never true).

[§] On Linguet's 'Viol puni,' a translation of Calderon's 'Alcalde de Zalamea,' the well-known Collot d'Herbois built his 'Paysan magistrat,' represented with success in 1777 at one of the provincial theatres of France, and again in 1789 at the Théâtre Français at Paris.

Not to mention numerous other instances of a similar kind, it should not be forgotten that Calderon's 'Secreto a voces' (The published Secret), has appeared in the Italian, French, and German languages.

The date of Calderon's death is variously stated, but that of 1681, on the 25th of May, Whitsuntide day, which is given by an old biographer, his great friend and panegyrist, appears to be the most correct; and to a certain extent it is confirmed by the word *octogenarium*, which occurs in a monumental inscription to the poet's memory in the parochial church of San Salvador, near the Hôtel de Ville of Madrid.

To revert to the parallel between the two great Spanish dramatists. Lope was bolder and ruder, Calderon more brilliant and refined, a keener observer of the female mind and manners, a readier contriver of plots, which are full of business and bustle, naturally arising from intricacies which are most happily disentangled in his *denoûements*. In this respect he surpasses even Moreto and Solis, but he does not always keep within the rules of strict morality. He allows vice too frequently to triumph, out of deference, probably, as some would have it by way of apology for him, to the fashionable morals of the time. The chivalrous delicacy as to the point of honour, which often supplies the place of morality, is displayed in its most favourable aspect in some of his dramas. Sometimes he appears to be seized with a moralizing fit, which contrasts strangely with the levity, merriment, intrigues, and mad gallantry which were exhibited for the first time on the Spanish stage in his 'Comedias de Capa y Espáda' (plays of cloak and sword). These pieces take their name from the dress in which they were performed (then the general costume of the gentry throughout Europe), and in contradistinction to the 'Comedias heroicas' (historical dramas), which were intended to excite surprise and admiration. In the latter, love is the feeling which actuated the champions of chivalry, while in the former it is merely a verbose and glozing gallantry which succeeded to the poetical worship of the fair. These being a sort of dramatised novels, on subjects selected from fashionable life, gave full scope to Calderon's elegance of language, gracefulness of dialogue, facility of versification, richness of diction, and fertility of imagination; qualities indeed which sometimes make him too diffuse.

Calderon gave the last polish to the Spanish theatre without changing its nature. He imparted dignity to the historical, or, as they were styled, *heroic* comedies; but while some of them are the best, others are the most trivial of his productions, and are full of historical blunders.

The greater part of Calderon's works were published at Madrid in 9 vols. 4to. 1689: the first three volumes contain his comedies, and the six last a great number of his Autos Sacramentales. They were reprinted at Madrid in 1726 and 1760 in 10 vols. 4to. A collection of his Autos appeared also at Madrid in 1759 in 6 vols. 4to. In 1830 George Keil published at Leipzig a splendid edition of Calderon in 4 vols. 8vo., to be followed by a fifth, which is to contain some of his inedited pieces and critical remarks. The 'Teatro Español,' published by La Huerta, gives but a partial idea of Calderon's talent; for he has selected the *Comedias de Capa y Espada*, two only excepted, one of which is styled *heroica*, although it belongs to the mythological class.

CALEDO'NIA, the name given by Tacitus and other antient writers to the most northern part of Britain, N. of the æstuaries of Glota and Bodotria (the Clyde and the Forth), which formed the permanent boundaries of the Roman province. Tacitus calls the natives the 'Britons who inhabit Caledonia,' and he says that the reddish colour of their hair and their large limbs denoted them to be of German extraction. (*Agricolæ Vita*, 11, 25.) Agricola was the first Roman general who came in contact with the Caledonians. In the sixth year of his government he advanced beyond Bodotria by land, while his fleet followed along the coast. He found a sharp resistance, and the ninth legion was surprised by night in its camp by the natives, who were at last repulsed after much loss on both sides. In the following year Agricola marched again into Caledonia as far as the Grampians, where more than 30,000 of the natives were posted under the command of Galgacus, their principal chief. The battle, which was won by Roman tactics, and attended with a dreadful slaughter of the Caledonians, is described in a most lively manner by Tacitus. In the night the natives retreated into the interior, after burning their houses or huts, and Agricola could not tell which way they had gone. Accordingly he moved back his army to the S. of the borders of Glota and Bodotria, the line between which he had fortified by strong outposts. [ANTONINE WALL.] There is no evidence of the Romans having ever after advanced much beyond those limits. The name of Caledonia has been often applied to Scotland in general, though improperly.

CALEDONIA, NEW. [NEW CALEDONIA.]

CALENBERG, a principality nearly in the centre of the kingdom of Hanover, now comprised in the Landdrostei or province of Hanover. It is a fertile tract, produces much grain, flax, hemp, &c., is well wooded in the western districts, and is watered by the Leine and Weser. Its area is about 1040 square miles. It contains 12 towns, among which are Hanover, the capital of the kingdom; Hameln, on the Weser (5800 inhabitants); and Eldagzen (2050); 12 market villages, and 392 villages and hamlets. The number of inhabitants was in 1812 about 139,200; 1822, 159,000; and in 1828, 162,540; it is now estimated at upwards of 170,000. In arable and garden lands it possesses about 295,000 acres, and in meadows and pastures about 120,000; the net income which they yield the owners is about 110,000*l.* (803,000 dollars), being rather more than five shillings per acre. Calenberg is also a royal bailiwick in the same principality; its name is derived from a burgh, situated on the right bank of the Leine, where the former dukes used to hold their court. The steward of this bailiwick has his office in Calenberg, a village on the Leine, with 9 houses and about 100 inhabitants.

CALENDAR. [KALENDAR.]

CALENDS. [KALENDÆ.]

CALEPI'NO, AMBRO'GIO, born at Calepio in the province of Bergamo, was an Austin friar, and wrote a Latin dictionary, which was one of the earliest works of the kind, and was first published at Reggio, fol., 1502. It went through many editions, most of them with numerous additions, which made it almost a new work. Passerat's edition, 1609, with the title 'Dictionarium Octolingue,' contains the corresponding words in Greek, Hebrew, Italian, German, Spanish, French, and English. Other editions added the Sclavonian and Hungarian. Facciolati, assisted by Forcellini, published a new edition of Calepino's, or rather Passerat's, dictionary, also in eight languages, two vols. fol., Padua, 1731. While engaged on this labour, Forcellini conceived the idea of a totally new and more complete and critical lexicon, and after spending 30 years in compiling it, he published it under the title of 'Totius Latinitatis Lexicon,' four vols. fol., Padua, 1771. Forcellini's lexicon superseded all former Latin dictionaries. A new edition has been lately published at Padua by the Abate Furlanetto. Calepino died in 1510 at a very old age.

CALF. The rearing and fattening of calves is a very important part of rural economy, and on the care with which this is done depends much of the profit of grass-land in particular situations. In the dairy districts the milk is so valuable, that calves are got rid of as soon as possible. In some countries they are killed when only a few days old, and the flesh is of little value, being very soft and tasteless. In others the flesh of very young calves is considered unwholesome, and penalties have been imposed on those who kill a calf before a certain age. This is the case in France and Switzerland, where ten days is the earliest time at which a calf is permitted to be killed for sale.

Wealth and luxury have introduced a very different mode of proceeding in England. Calves are suckled with great care, and allowed to take as much milk as they can swallow, in order to make them fat, and their flesh white, firm, and delicate. The price at which a fat calf is sold, when ten or twelve weeks old, is often much greater than he would fetch at twelve months, if reared in the common way. It is chiefly in the neighbourhood of large towns that the practice of fattening calves is profitable. The calf-dealer buys calves in the dairy districts, and sells them again to those who suckle them. The animals are carried to a great distance in carts made purposely flat and shallow, their four feet tied firmly together, and their heads hanging over the back and sides of the cart. In this position they remain whole days without food or drink, and when they arrive at the place of sale they are so weak and attenuated that many of them die; and all of them require the greatest care and attention for several days before they recover sufficient strength to bear their natural food. If they are allowed to satisfy their appetite at first they invariably *scour*, that is, purge violently, and die. If the strong astringent medicines sold in the shops for the scouring of calves is given to them in this weak state, it only accelerates

The best remedy is to boil the milk for them, and give them little at first; to mix some starch or arrowroot with it, and to give them a raw egg beat up in milk. This restores the strength of the stomach, and generally cures them. When the calf begins to thrive on the milk which he sucks, or which is given him warm from the cow, nothing more is necessary than to keep him extremely clean and dry, to give him plenty of air, but not much light, and never to disturb him between his meals, which are generally twice in the day, at the usual time of milking the cows. Where it can be conveniently done, it is better to let them suck three times a day. If one cow does not give sufficient milk to satisfy the calf when he begins to get large, another cow must be at hand. Where a number of calves are fattened at once, and no butter or cheese is made, the number and age of the calves must be regulated by the number of cows and the quantity of milk which they give, so that there shall be milk enough for all.

The calf pens should be made like narrow stalls, each for the accommodation of only one calf, just wide enough to allow him to lie down, but not to turn about and lick himself, which, if it become a habit, will much retard his progress in fattening. The bottom of the pen should be paved with brick, and washed clean morning and evening—or it should be boarded; the boards should be six inches from the ground, and have holes bored in them to let the urine drain through. A piece of chalk or powdered limestone is frequently put in a small trough, which the calf licks, and thus corrects the acidity which is apt to be generated in the stomach. The common notion that it makes the flesh whiter is a mistake, except so far as good health in the calf produces whiter flesh. When the calves are taken out of their stalls to suck the cows, they must not be allowed to play instead of sucking. If they appear not to have much appetite a little salt may be rubbed into their mouth, and they may occasionally have a raw egg put down their throat. At five or six weeks old, if a little sweet hay is tied in a small bundle with a string and hung before them, they will pick a little of it; and by thus exciting the saliva the digestion will be assisted. It is only by minute attention that the suckling of calves can be made more profitable than the making of butter or cheese. When it is well managed, and the price of veal is about one-half the price of butter by the pound, there is an advantage in suckling, but otherwise making butter is more profitable.

Calves should be fat by eight or nine weeks old, and it is seldom advisable to keep them above twelve weeks. When they get large they take a much greater quantity of milk, in comparison with what they do at seven or eight weeks old, to produce the same increase of flesh. A calf of 16 or 18 stones (eight pounds to the stone) the four quarters, and well fatted, will always sell better than one that larger.

When milk is scarce, and the calves have not enough to satisfy them, it may be necessary to give them some substitute, such as meal mixed with warm milk or balls of meal and water with a little gin in them, which makes them drowsy. Linseed made into a jelly with boiling water and mixed with warm milk is given by some, or powdered oil-cake. All these substitutes can only be recommended when the milk fails—they deteriorate the flesh more or less. The best plan, in such a case, is to sell the largest calves and reduce the number, so that they may all have their fill of milk. To know the weight of the four quarters of a calf when killed, take the live weight and multiply it by 0·6. Thus if a live calf weighs 200 pounds, his four quarters when he is killed will weigh 200 × 0·6 = 120 pounds.

When calves are intended to be reared for grazing or for the dairy, the most perfect individuals should be chosen. They should be well examined, especially the cow calves, to ascertain whether they have a perfect udder and teats, a broad pelvis, and good lungs. If any deficiency appears, they ought to be sold or fattened. They should be allowed to suck the mother three or four days, but no more, and then be taught to drink milk out of a pail. This is soon accomplished by gentleness and care. Should there be any difficulty in teaching him to suck with the hand in the usual way, a wisp of twisted straw is put into the pail and one end of it in his mouth. This seldom fails to bring him to drink. When the calf is a week old, skimmed milk which has been boiled and allowed to cool again, so as to be milk-warm, may be given him. After a time this may be diluted with water, and a little meal stirred into it; or some thin gruel may be made to which skimmed milk is added. Carrots or turnips make an excellent food for calves, especially if they are boiled with cut hay and given warm. In this way calves may be reared with very little milk, till they can live on grass alone. A bull-calf not intended to be kept as a bull may be castrated when three months old.

The diseases of calves are chiefly *scouring* and *constipation*; for the first, if the calves are strong, the following recipe is recommended by Clater, and appears likely to remove the complaint:—prepared chalk four ounces, crabs' eyes two ounces, white powder of burnt bones two ounces. These ingredients are pulverized and well mixed, and a large table-spoonful of the powder is given in a pint of new milk every night and morning before the calf is fed, until the purging ceases. For costiveness the following is a good and safe remedy:—castor oil one ounce, prepared kali half a drachm, ginger in powder one tea-spoonful. Mix these for a dose, and give it in half a pint of warm milk.

CALIBRE, CALIPER, or CALLIPER. The first of these words is French, and was a technical term of artillery, signifying the internal diameter or *bore* of any piece of ordnance. Since it has been naturalized in England, it has come to signify generally the diameter of any round substance, and figuratively the extent of intellectual or other qualities. Calipper compasses or callipers are compasses intended to measure the calibre or diameter of round bodies, and are formed with curved legs, knobbed instead of pointed. Being opened until the body to be measured can only just pass through them, the distance between the two internal extremities of the knobs is of course the diameter of the body.

CALICO. [COTTON.]

CALICO-PRINTING, the art of dyeing woven fabrics of cotton with variegated figures and colours more or less permanent. It has been practised from time immemorial in India, upon the kind of cotton cloth called calico, from Calicut.

There are very few dye-stuffs capable by themselves of imparting to cotton colours of sufficient lustre and durability combined. They must in general be rendered fast as well as brilliant, by the intervention of certain substances, which, in consequence of their attraction for the textile filaments and the colouring matters, form a bond of union between the two, and are on that account sometimes called bases, and at other times mordants, from their taking firm hold of, or biting, the dyes. These intermediate bodies, though colourless themselves, generally possess the power of modifying more or less the colour of the dye, or of producing from the same dye-stuff different tints; so that a piece of white cloth, after being imbued with various mordants, will assume various colours in a single dye-vat. Thus if white calico be impressed with the mordant of acetate of alumina in one set of lines, with that of acetate of iron in a second, and with a mixture of these two mordants in a third, on being exposed to the madder bath for a proper time, it will become permanently printed in red, black, and chocolate stripes.

This curious process would seem to be characteristic of the scientific refinement of the present time, and yet it was known to the ancient Hindus and Egyptians. Pliny describes it with sufficient precision. 'Robes and white veils are painted in Egypt,' says he, 'in a wonderful way; being first imbued, not with dyes, but with dye-absorbing drugs, by which they appear to be unaltered, but when plunged for a little in a cauldron of the boiling dye-stuff, they are found to be painted. Since there is only one colour in the cauldron, it is marvellous to see many colours imparted to the robe, in consequence of the modifying agency of the excipient drug. Nor can the dye be washed out. Thus the cauldron, which would of itself undoubtedly confuse the colours of cloths previously dyed, is made to impart several dyes from a single one, painting while it boils *.'

In India, where manufacturing processes have probably suffered little change in the course of three thousand years, not only is the art of using mordants well known, but that of applying resist pastes, in order to preserve the cloth from the action of the dye-bath in any desired figures or spots. In the Société Industrielle of Mühlhausen, a town of great celebrity in calico-printing, may be seen specimens not only of modern Indian calicoes in the preparation state, topically covered with wax, to serve as a resist to the indigo dye, but of ancient styles of pencilled cloths, which had been the work of princesses, covered with figures of such complexity as could not be made without a very tedious and costly education, beyond the reach of ordinary artisans. Among other curiosities, the counterpane of a state bed is shown, six yards long and three broad, which must have taken a lifetime to execute, on their plan of applying the melted wax with a pencil.

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* 'Natural History,' book xxxv., chap. ii.

Processes of printing, similar to the Indian, have been long practised in Asia Minor and in the Levant; but they were not attempted in Europe till about the middle of the seventeenth century, some time after its extended commerce had made the brilliant colours of the eastern world objects of general admiration and desire. Anderson, in his 'History of Commerce,' places the origin of English calico-printing as far back as the year 1676; but Mr. Thomson, of Primrose, near Clitheroe, a better authority, assigns the year 1696 as the date of the commencement of this art in England, when a small print-ground was established on the banks of the Thames, at Richmond, by a Frenchman. The first large establishment of the kind was at Bromley-hall, in Essex. It was not till the year 1768 however that the business was carried into Lancashire, where it now constitutes one of the most interesting and productive branches of English manufactures. From its outset, the printing of cotton goods encountered the keenest hostility from the silk weavers of Spitalfields, who in the year 1680, and often afterwards, assailed in a riotous manner the East India House, on account of the Company importing the chintzes of Malabar. The English government gave way to the remonstrances of the silk trade, and imposed, first of all, heavy duties on Indian calicoes, and in 1700 prohibited their importation altogether. This law became nearly inoperative, in consequence of the excessive penalties annexed to its infraction. In 1720 the wear of all printed calicoes whatsoever, foreign and British, was prohibited by a new law, passed for the purpose of allaying the clamour of the woollen and silk manufacturers; but in 1730 parliament was pleased to permit British calicoes only, made of cotton weft and linen warp, to be printed and worn, on paying a duty of 6*d.* the square yard. It was not till 1774, and after a most expensive application to parliament, that cloth made entirely of cotton was allowed to be printed, though cotton cloth was far better adapted to the purpose than the mixed webs of linen and cotton, which took on the colours unequally, owing to the unequal attraction of these two fabrics for dyes. The calico-printing of this country continued to groan under the most oppressive fiscal laws till the year 1831, when they were finally repealed, and the business was left to its natural rate of development, under the taste, science, and capital of the country. Since that time it has probably quadrupled in extent; a single manufacturer, Mr. Coates of Manchester, has turned off in one year a million of pieces.

Linen was long ago, and silk and woollen fabrics also have recently been made the subjects of topical dyeing, upon principles analogous to those of calico printing, but with certain peculiarities, arising from the nature of their textile materials.

Calicoes, muslins, &c. intended for printing must be first of all freed from their fibrous down by the action of the singeing machine. This consists either of a semi-cylinder of cast-iron laid horizontally, and kept at a bright red heat by a furnace, or of a horizontal range of gas-jet flames: over one of these the plane of cloth is drawn with a steady continuous motion, and at a rate suited to its texture. When gas flames are employed, a line of suction-tubes is placed over the extended web, to draw the flame up through the interstices of the cloth, which effectually clears the threads, according to the ingenious plan of Mr. Samuel Hall, of Basford. Some manufacturers singe the goods as they come from the loom; but they would find their advantage in previously washing out the weaver's dressing from them at the dash-wheel, and then drying and calendering them.

The cotton cloth must be next well bleached, because the whiter it is the more light will it reflect from its surface, and the more brilliant will be the colour of its dyes. The first step in the bleaching process is boiling the cloth in an alkaline bath, which for delicate fine goods consists of a weak solution of soda, and for stronger articles slaked lime and water. For this purpose a bowking apparatus merits the preference. It consists of a large egg-shaped cauldron, with a flat false bottom placed a little above the rounded true one, to protect the cloth from the danger of being scorched by the fire. Through the centre of the false bottom a vertical pipe rises from near the real bottom to somewhat higher than the top of the cauldron, and carries a conical cap (umbrella-wise) above its open mouth. The boiler being filled with goods, and supplied with a proper quantity of the detergent liquid, is securely covered with a dome-shaped lid. Whenever ebullition becomes active, the steam forces a constant stream of liquid up the central pipe, causing its constant overflow, whereby the goods are irrigated and soaked with the boiling hot ley of lime, soda, or potash. During its descent it is partially cooled, but on reaching the bottom it recovers its ascensional power by the agency of the steam, and thus circulates up and down as long as the heat is maintained. The cauldron having been allowed to cool a little, the goods are removed, and subjected either to the rinsing operation of the dash-wheel, or to the proper rinsing machine. This consists of a range of wooden rollers in pairs, each lying upon its fellow, mounted in a horizontal plane upon the top edges of an oblong wooden cistern filled with water, with single roller pins at the bottom of the cistern, in correspondence with, like hand and glove, the top ones. The beginning of a series of webs stitched together at the ends being introduced between the roller pins above and round the roller pins below, the last or traction roller is placed in connexion with the moving power of the factory, while a stream of pure water is made to flow through the cistern. The cloth is thereby alternately squeezed between the top rollers and immersed in the water, so as to get effectually rinsed with hardly any manual labour. In some calico print-works, this rinsing apparatus occupies a length of forty or fifty feet.

The goods are next steeped for a few hours in a leaden or wooden cistern, containing a weak solution of chloride of lime, usually called bleaching salt. They are once more rinsed. They are now boiled in an alkaline ley, made of crude soda dissolved in water and freed from its impurities by filtration or subsidence. The goods are again rinsed, and finished by a steep in sulphuric acid very largely diluted with water. This removes any adhering particles of lime or iron, which would be apt to give the cloth, after some time, a yellow tint. They are last of all rinsed, dried, and sometimes smoothed under the calender. If they are not calendered, they are run through a machine called in Lancashire the *candroy*, which spreads them smoothly in the act of rolling them upon a cylinder.

There are four mechanical modes of printing calicoes. first, by small wooden blocks, worked by hand; second, by large wooden blocks, set in a frame, and worked by a machine called the *Perrotine*, from the name of its ingenious inventor, M. Perrot of Rouen; third, by flat copper plates (a method now nearly obsolete); and fourth, by copper cylinders, mounted in a machine of great elegance and productive powers, but of no little cost and complexity, called a one, two, three, four, or five-coloured calico-printing machine, according as it is mounted with one, two, or more cylinders. The fifth colour is generally applied by what is called a surface cylinder, covered with figures like types in bas-relief.

The blocks are made of sycamore wood, or of deal faced with sycamore. They are about ten inches long and five broad, with an arched handle on the back for holding them by. The face is either cut in relief into the design required, or the same object is obtained by the insertion edgewise into the wood of narrow slips of flattened copper wire, in the desired configurations. These narrow fillets have one edge inserted into the wood, are fixed by the taps of a light hammer, and are all filed down and polished into one horizontal plane, to secure equality of impression in the several lines. The interstices between the copper ridges are filled up with felt-stuff. Occasionally both the wood-cutting and insertion plan are combined in one block.

Calico printing by hand is performed by applying the face of the block to a piece of woollen cloth stretched over one end of a sieve-hoop, and imbued with the colouring matter of a thin pasty consistence by means of a flat brush. The block is then applied to the surface of the cotton cloth while extended upon a flat table covered with a blanket, and the impression is transferred to it by striking the back of the block with a light mallet. This method, besides the great cost of labour which it involves, has the inconvenience of causing many irregularities in the execution of the work. It has been superseded to a considerable extent, both in France and Belgium, by the Perrotine, a machine of a most novel and elegant description. Three thin wooden blocks, engraved in relief, about three feet long and from two to five inches broad, are successively brought to bear on three of the four faces of a prismatic roller of iron, round which the cloth is successively wound. Each block rests on springs which enable it to press with the delicacy of a skilful arm; and each receives its peculiar coloured paste from a woollen surface imbued by a mechanical brush in rapid alternation. We have seen this machine operate in many print-works with surprising speed and precision, its moving shaft being driven either by arms or by a steam pulley-band. One man, with three children for superintending the three colours, can turn off about thirty pieces English in a day, which is the work of fully twenty men and twenty children in ordinary block-printing. To print a piece of cloth by hand the block must be applied 448 times for each colour. The machine, moreover, may be conducted by persons with little manual dexterity, and therefore entitled to comparatively low wages. The use of the Perrotine is spreading rapidly into every quarter of the continent, even into Russia, though hitherto unknown in England. It executes a style of work different in some respects from that of the cylinder.

This latter machine is a hollow cylinder of copper fully three feet long and three or four inches in diameter, whose surface is engraved, not by the hand-graver, but by the mechanical pressure of a steel roller from one to two inches in diameter and three inches long, which transfers the figures engraved on it to the relatively softer copper. The first steel roller, called the die, is softened before being engraved in intaglio; it is then hardened, and made, by a powerful volutory press, to transfer its design in relief to a similar die called the *mill*, which is the one used for transferring the design to the copper cylinder. The process of etching is also sometimes had recourse to for covering the cylinder with various figures.

The engraved cylinders are mounted upon a strong iron shaft or arbor, carrying a toothed wheel at its end, in order to put it in train with the rotatory printing machine, for one, two, or more colours. On a roller, at the upper part of this apparatus, are wound whole calico webs stitched together, the end of which is then introduced between the engraved copper cylinder and a large central cylinder covered with blanket, against which it is made to bear with regulated pressure. The engraved cylinder turns on the top of another cylinder covered with woollen cloth, which revolves with the former while its under part is plunged in an oblong trough containing the dyeing matter, which is of a pasty consistence. The engraved cylinder is thus supplied with *an abundance of impressible colour*, and is cleared from the superfluity by the thin edge of a flat ruler made of bronze, called vulgarly the doctor (*ductor*), which is applied obliquely to it with a gentle force. The cylinder, after its escape from this wiping tool, acts upon the calico, and rolls it onwards with its revolution, imparting its figured design with great precision.

Three and four-colour machines are now made at Manchester, of such excellence that they will print a piece of 28 yards per minute, each of the three or four cylinders inserting its distinct colour or mordant into the pattern. At this rate the astonishing length of nearly one mile of well-coloured design of exquisite beauty is printed in an hour. Such is the combined result of mechanical and chemical science, each of them brought to a high pitch of perfection.

Dye-stuffs, capable alone of imparting fast colours to calico, have been called substantive; and such as require the intervention of a mordant, adjective. Indigo, catechu, and certain metallic oxides, belong to the former class; madder, cochineal, and Persian berries, to the latter. There are five general styles of work in calico-printing:—

1. The fast-colour or chintz style, in which the mordants are applied to the white cloth, and the colours of the design are afterwards brought up in the dye-bath.

2. Where the whole surface receives a uniform tint from one colouring matter, and figures of other colours are afterwards brought up by chemical discharges and reactions. This is called the Rongeant style in France.

3. Where the white surface is impressed with figures in a resist paste, and is afterwards subjected to a general dye, such as the indigo-vat.

There are besides a few partial styles of work of a peculiar nature.

4. Steam-colours, in which a mixture of the mordants and dye-extracts is applied to the cloth, and the chemical combination is effected by the agency of steam.

5. Spirit-colours, consisting of mixtures of dye extracts with nitro-muriate of tin. These cannot be exposed to a steam heat without corroding the cloth. This style is brilliant, but fugitive.

There are only three bases which are of much importance as mordants—clay—iron—and tin. The first is commonly employed in the state called acetate of alumina; the second, acetate of iron; and the third, nitro-muriate, and oxymuriate, or perchloride, of tin.

The first mordant is prepared by the makers of wood vinegar, who decompose alum by acetate of lime, both being in a state of solution. It is called red liquor because it is the mordant for reds in calico-printing. The second mordant is made by exposing iron turnings to the action of crude vinegar. The third mordants are prepared by the ordinary chemical means, which we need not here describe. For the most delicate purposes the acetate of alumina is prepared according to the following excellent French prescription:

50 gallons of boiling water
50 pounds of alum
10 „ of soda crystals
37½ „ of acetate of lead.

The alum is to be dissolved by pouring the water upon it in a tub, and stirring with a rake. The soda crystals are to be added gradually to that solution. When the effervescence is over, the acetate of lead, well pulverized, is to be strewed in at once, and stirred about till it disappears by decomposition. A deposit of sulphate of lead is formed at the bottom. Acetate of alumina, mixed with a certain portion of alum, is contained in the supernatant liquor. To form an acetate of alumina free from alum, 82 parts of acetate of lead, instead of 37½, should be employed for 50 of alum. About one-half of the alum therefore remains undecomposed in the above operation. For certain purposes a formula is prescribed in which 50 pounds of acetate of lead are used to 50 of alum.

The clay mordant is used also for particular styles in a state of combination with potash. It is prepared from the following ley:

100 gallons of water
100 pounds of potash
80 " of quicklime, boiled together for an hour.

After the calcareous matter is settled, the clear liquor is to be drawn off and boiled down to specific gravity 1·320 (64° Twaddell's Hydrometer). In 30 gallons of this ley, 100 pounds of pulverized alum are to be dissolved at a boiling heat. On cooling, crystals of sulphate of potash form.

The supernatant liquors being decanted, and the crystals slightly washed with water, about 33 gallons of mordant will be obtained.

The tint or shade of colour produced in the dyeing-bath is proportional to the strength of the mordant previously applied to the cloth. Hence by diluting the mordant to various degrees, any desired shade may be obtained—as by mixing the red liquor and the iron-liquor any shade intermediate between red and black is producible in the madder-bath. When the iron-liquor is diluted, various shades of violet result from the same dye. Too much of this aluminous mordant should not be prepared at a time, as it is injured by keeping in consequence of its letting fall subsulphate of alumina.

The thickening of mordants is one of the most important operations in calico-printing, for the permanence and beauty of the impression depend not a little on the consistence and quality of the inspissating substance. Several circumstances require the consistence to be modified; such as the nature of the mordant, its density or acidity. A strong and acidulous mordant does not thicken well with starch; it requires British gum or gum Senegal. Some other mordants inspissated by starch, which have a tendency to liquefy after some days, are also liable to run during their printing on, an inconvenience easily counteracted in France by the addition of two ounces of alcohol to the gallon of the mixture, a remedy which cannot be economically practised in this country from the excessively high duties on spirit of wine. The same mordant, when thickened in different degrees, gives different shades in the dyeing; for instance, one thickened with starch gives a deeper shade than when thickened with gum. Yet there are many cases where the latter merits a preference, because it imparts more transparency to the colours, whereas a portion of starch often remains in the cloth along with the mordant after the rinsing operation. In general, however to obtain a like consistence, much more gum is required than starch, and thus the former not only dilutes the mordant much, but by letting it dry too quickly prevents its forming an intimate combination with the stuff. Hence the tints are thin and scratchy.

The substances usually employed for thickening are the following:—1. Flour starch; 2. flour; 3. roasted starch; 4. gum Senegal; 5. gum tragacanth; 6. salep; 7. pipe-clay mixed with gum Senegal; 8. sulphate of lead and gum; 9. sugar; 10. treacle; 11. glue.

Care should be taken, after thickening with gum, not to add any metallic salts in a liquid state, such as nitrate of iron, solutions of tin, copper, subacetate of lead, &c.; for they have the property of coagulating gum. The thickener should, in fact, be skilfully adapted to each particular colour, a rule too little observed by British calico-printers.

In the colour-house there ought to be ready prepared a variety of dye-decoctions, concentrated to a proper degree either by steam boilers, or by liquid baths of regulated temperature. When evaporated over a naked fire their tint is generally degraded. The following prescription may serve as an example:—Take 5 lbs. of Brazil-wood or peach-wood, boil it for an hour in 10 quarts of water, and strain; boil the residuum in the same quantity of water for half an hour, and again strain; finally boil it a third time, and mix the whole strained liquors together. Evaporate the whole till it be reduced to 10 quarts. Add as much red mordant (acetate of alumina or nitro-muriate of tin) to the liquor as will brighten its tint to the desired degree, and thicken it with British gum. The older the decoction the more beautiful will the colour be. The decoctions usually kept ready are those of logwood, Brazil-wood, peach-wood, Persian-berries, quercitron, galls, fustic, archil, cochineal, ammoniacal cochineal, and catechu.

The printing shops ought to be kept always at a pretty high temperature, as from 65° to 75° Fahrenheit; with an atmosphere rather humid than dry. It is often observed that goods printed the same day and with the same mordant exhibit inequalities in their tints; being sometimes strong and well brought out in one part, flat and meagre in another. The latter portion has been printed in too dry an atmosphere, an accident more liable to happen with cylinder goods than others on account of the small quantity of colouring matter which they receive. The nearer the mordant is to a neutral state, the less likely is this inconvenience to ensue. In the padding process, where the cloth is uniformly imbued with the mordant, the stove-room, where a great many pieces are dried at the same time, ought to have a free issue for the watery and acetic acid exhalations. The goods ought likewise to be properly extended before they are dried, for without this precaution the acetic acid would accumulate in the folds, and prevent the base of the mordant from combining with the fibres of the cloth. The consequence would be white spots in all such places, which would render the print unsaleable. When a strongly acid mordant has been employed, too much pains cannot be bestowed in facilitating its escape from the hot flue through which the goods are drawn in the drying, for the acetic fumes are capable of affecting the surface to such a degree as to cause a white down to appear upon the cloth after it is dyed. Fans will be found very useful in such cases to blow away the acidulous vapours.

After these general remarks we proceed to describe the processes of each of the five styles of printing above enumerated:—

I. *The chintz or madder style*, upon a white ground.

The following topical colours belong to this head: 1. *Black.* It consists of two quarts of iron liquor, sp. grav. 1·040 (8° Twaddell), thickened with four ounces and a half of starch, and four and a half of flour; the starch being first rubbed up with a little of the liquor, then mixed with the flour. The old liquor being added, the mixture must be boiled over a brisk fire to form the paste, care being taken meanwhile to stir so as to prevent its being burned by sticking to the bottom. The colour is to be poured into an earthen pot, over half an ounce of olive-oil, and the two are to be thoroughly incorporated. 2. *Red.*—Take two quarts of red liquor at sp. grav. 1·03[illegible] (6½° Tw.), eight ounces of starch, and tinge with a little Brazil-wood. Boil for five or six minutes, and pour into a pipkin, stirring all the while. Different shades of red are obtained by preparing mordants of different strengths from the above, thickened either with raw or roasted starch. 3. *Dark Puce.*—Take one quart of red liquor at 8° Tw., one quart of iron-liquor at 8° Tw.; Mix, and thicken like black, No. 1. By varying the proportions of the two liquors any brown tint may be obtained. When British gum is employed to thicken reds one pound and three-quarters of it are required for every two quarts of the liquor; in which case no other tingeing substance is needed. 4. *Violets.*—Take two quarts of iron-liquor of sp. grav. 1·007 (1½° Tw.), thicken with starch, and tinge with a little logwood. These four mordants, for four colours, are sometimes applied at once, but where brilliant reds and rose-colours are wanted the dark colours must be inserted separately, after the bright ones are raised, by a subsequent process called grounding (filling up the ground of the figures) in this country, and *rentrures* (re-entering additional colours) in France.

The goods, after being thus printed by the rollers, the hand blocks, or the perrotine, must be hung up in a warm chamber for 36 hours at least before having their colours brought up in the dye-house.

The dyeing may be divided into three operations. 1. The dunging; 2. the maddering; 3. clearing the madder-grounds. The grounded colours will be treated of afterwards.

1. The dunging is undoubtedly one of the most important though mysterious processes in calico-printing, and too much pains cannot be bestowed upon it, since it determines in a great measure the success of the madder-dyes. Its objects are the following:—1. to effect the complete combination of the subsalts with the cloth, and to separate the acetic acid which had not been dissipated in the stove room: 2. to dissolve and separate from the cloth a portion of the substances used for the thickening, and to wash away at the same time the mordants mechanically retained by the paste; 3. to prevent the uncombined part of the mordants, as well as the acetic acid, with which the bath becomes eventually charged, from re-acting upon the part of the mordant combined with the cloth, or from attaching itself to the white ground. Cow-dung, the kind employed, affords to chemical analysis the following constituents:—1. an animalized fibrous substance, to the amount of ten per cent.; 2. albumen; 3. animal mucus; 4. a substance resembling bile; 5. several salts, of which the principal are muriate of soda and of ammonia, acetate of ammonia, and phosphate of lime; 6. benzoin, or musk, which gives it a peculiar flavour. Among all these ingredients the fibrous matter plays the principal part in the dunging of prints, from its great affinity for the alumina and the oxide of iron; it seizes them the moment they are diffused in the bath, and thereby prevents their being deposited upon the parts of the cloth which should remain white.

The chalk occasionally added to the dung-bath serves to neutralize the acids as they are evolved from the mordants; a little carbonate of soda is used in preference by some printers.

For delicate pinks, pale yellows, and cochineal lilacs, a bran-bath answers better than one of dung.

The dung-bath cistern is now made of an oblong rectangular form, three or four feet wide, four or five feet deep, and 12 or 15 feet long. Cast iron is usually employed for making the cisterns in this country, and wood for those of the continent. It has one range of rollers level with the surface of the liquor, and another range near the bottom, over and under which rollers the expanded cloth is slowly passed in a serpentine course, so as to ensure the thorough operation of the dung upon it. The rollers revolve by mechanical power, the extreme one being double, and placed above the cistern like a calender to draw the cloth (which is in webs stitched together) continuously through the bath by means of a cord tied to its end. One pail of dung is diffused through fifty or sixty pails of water. The bath must be replenished with dung from time to time, as it gets exhausted by the passage of the mordanted goods. The temperature of the bath should be maintained at about 150° Fahr. by means of a steam-pipe entering at the bottom. The duration of dunging is different for different goods, from fifteen to twenty minutes being the average time, which is regulated by the speed of the discharging calender rollers. Too high a temperature and too much dung are injurious to delicate colours, such as the pinks and the yellows; but colours thickened with starch require a higher temperature than those thickened with gum. The piece should never be allowed to stop for a moment in its progress through the bath, for the part in contact with the surface of the water would run, and cause a line mark across the cloth.

The goods must be washed in the dash-wheel, or run through a rinsing trough, and then winched through a fresh dung-cistern (commonly called a dung-copper) at a lower degree of heat than the former, and then washed again. They are now ready for the dye-bath.

Madder always contains a free acid, which is more abundant in some species of the root than in others; that grown in calcareous soils often contains so much chalk as to be sufficient for neutralizing the acid in the bath. The other species requires the addition of a little chalk or carbonate of soda, but care must be taken not to add an excess, for that would degrade the colour. Madder is the only dye-stuff which can saturate mordants so completely as to permit the goods to be subjected to other dyeing-baths, such as yellows, olives, &c. without losing its brilliancy by these fresh operations.

Black, red, and chocolate are dyed with madder and sumach, but purple with madder alone. Different quantities of madder are used according to circumstances, from one pound to three pounds and a half per piece of 21 yards, the sumach being one-eighth of the madder. The goods are entered into the automatic-reel bath when the copper is cool, the heat being brought up by slow degrees by means of internal steam-pipes, or an external fire, during the course of two or three hours, till ebullition begins. The boiling is continued sometimes for a quarter of an hour. The goods are all the time kept in a state of constant motion, down through the liquid bath on one side, up through the air and incumbent steam, and down into the bath through the other side, there being an open frame of wooden spars between them and the two sides of the copper. They are then washed and boiled in bran and water for ten or fifteen minutes; indeed if they have much white they must be branned a second time or even a third time, to clear the ground, and must be washed between each branning operation. The whitening is completed by spreading the goods upon the grass for a few days, or by passing them over a self-acting winch-reel, through a weak solution of chloride of lime.

For strong reds a second maddering is sometimes given. In all these dyeing operations too great a length of cloth should never be winched over one reel, for it would be left too long in the bath, and might get spotted or stained. The modern automatic coppers are of an oblong shape, semi-cylindrical at bottom; and the revolving axis which runs along their top is mounted with eight or ten reels, each of which winches only a few pieces tacked together into an endless web.

Reds and pinks are brightened by being winched for half an hour through a soap bath, at 150° Fahr., containing three-quarters of a pound per piece. They are then washed in clear water. At other times they are passed for a quarter of an hour through a bath containing a little of the solution of nitro-muriate of tin, called spirit by the dyers; and are then soaped, and rinsed, and laid out upon the grass; or cleared, as in France for fine colours, with a weak solution of chloride of soda.

The grounding colours, or topical dyes, employed after the maddering, are the following:—

1. Pencil-blue: to two quarts of water heated to 145° Fahr. put eight ounces of indigo, eight ounces of orpiment, each in powder, and eight ounces of quicklime. Heat the mixture up to the boiling point; withdraw the vessel from the fire, and when its contents are lukewarm, add six ounces of subcarbonate of soda (dry); stir the whole ingredients well together, and let them settle for twenty-four hours. The clear liquor being decanted off, is to be thickened with one pound of gum for each two quarts of it in measure. This colour was formerly introduced by the pencil; it is now applied by one of the rollers of the calico printing-press. Twenty-four hours after receiving this impression, the cloth must be rinsed in running water.

2. Another pencil-blue is made as follows:—take two quarts of caustic soda-ley, sp. grav. 1·160 (32° Tw.) heated to 145° Fahr., add twelve ounces of hydrate of protoxide of tin, and eight ounces of ground indigo. Heat the mixture till it boils, removing or applying the heat twice or thrice. Lastly, let it cool, and thicken with three pounds of raw sugar. The application of this colour requires very nice management. Dry, fine sand is sometimes dusted over the piece as soon as it is printed, to prevent the colour from running. If these blues be not skilfully and rapidly introduced, the tints are liable to differ in different parts of the [illegible]

3. The following affords an excellent cylinder blue:—fourteen quarts of caustic-lye, as above; three pounds and a half of indigo; five pounds of hydrate of protoxide of tin. Boil the mixture for ten minutes; take it off the fire; add three pounds of Venice turpentine, and then thicken with eleven pounds of pulverized gum. Print on this colour; let it dry for two days; wash in the dash-wheel; and pass the goods through a soap-bath, containing a little soda to brighten the blue, and take off its grey tint. The turpentine serves to obstruct the contact of air in the pot with the deoxidized indigo, which would spoil it as a dye before application.

4. Topical Prussian blue dye:—diffuse through two quarts of water eight ounces of starch, boil, and pour into a pipkin. Take two ounces and a half of Prussian blue, grind it up with three ounces of muriatic acid, and after twenty-four hours dilute with two ounces of water. Mix this preparation with the above starch-paste while it is warm. When the mixture is cold, add to it four ounces of oxymuriate of tin, and pass the whole through a sieve. Goods grounded with this colour must be passed merely through the rinsing trough.

Topical yellows are prepared from Persian berries, quercitron, and bi-cromate of potash; orange from the sub-chromate of lead; green from nitrate of lead, bi-cromate of potash, Prussian blue, and nitrate of zinc. The details of their preparation exceed the limits prescribed to this article.

II. Yellow-dye or Bath.

For bark-yellows, the same mordant is used as for madder-reds. The piece, when slightly dunged, is winched in the quercitron-bath, heated gradually up to from 130° to 140° Fahr. during about an hour. A gold colour is given in the following way:—dissolve five pounds of sulphate of iron, and one and a half of acetate of lead, in a gallon of water; mix well, and after the precipitated sulphate of lead has subsided properly, decant the clear liquor, thicken it with gum, and apply the paste by the block or cylinder to the cloth; expose to the air for eight or ten days; and then winch it through a solution of potash thickened a little with lime. Whenever the black oxide of iron first precipitated upon the cloth begins to turn red, the piece must be removed into a rinsing cistern and well washed. Yellows are however now given very generally with chrome. For this purpose the following prescription will serve:—thicken two quarts of water with six ounces of starch, pour the paste into a pipkin and add to it immediately four ounces of acetate of lead, and four ounces of nitrate of lead, both in powder; mix the ingredients well, and leave the mixture to settle and cool, colouring it with a few drops of solution of chromate of potash. Print on this paste with the cylinder or the block, and pass the goods through a roller dyeing-bath containing bi-cromate of potash dissolved in the proportion of two ounces per piece; having first charged the cistern with a solution containing half a pound in solution. Then pass them first through the rinsing-rollers, and finally through a very dilute muriatic acid to clear up the ground.

Green printing with chrome may be performed as follows:—mix two quarts of caustic soda-lye at 1·160 sp. gr. (32° Tw.) with three ounces of ground indigo and ten ounces of hydrated protoxide of tin. Heat the mixture to the boiling point, withdraw it from the fire, and when lukewarm add, by slow degrees, a solution of one pound of acetate of lead in half a pound of acetic acid of sp. gr. 1·050. When the effervescence ceases, thicken it with twenty ounces of gum and twenty ounces of roasted starch. Pass the mixture through a very fine searce or sieve. After this paste is applied by the cylinder or block, the goods must be passed through milk of lime for ten minutes; then plunged for an hour in running water, and well rinsed. They must now be passed through a solution of bi-cromate of potash then rinsed, and finally passed through weak acetic acid to clear the grounds. They may now be dried and prepared for the market. This colour requires for its perfection, that the goods be not [illegible] through the bath in too dry a state, because the [illegible] be apt to scale off. Before passing them through [illegible] machine therefore they should be hung up to [illegible] a humid atmosphere.

Madder purp[illegible] obtained by the application of the acetate of iron mordant allowed to act upon the goods hung p in the air for six or eight days; and after dunging, and passing them through the madder-bath, then branning and clearing.

Cochineal pink is communicated by applying the aluminous mordant, with the precautions above prescribed, and raising the colour in a bath containing about an ounce of cochineal for every piece of cloth. Cochineal has a feeble affinity for cotton, and neither needs nor admits any other process for clearing the ground except simple washing in water.

Manganese brown.—Solution of sulphate or muriate of manganese, properly thickened, being printed on, the calico is to be dried, and passed through a powerful caustic lye; from which it must drop into a solution of chloride of lime. The manganese is thereby raised to a higher state of oxidizement, in which it exercises a pretty strong affinity for cotton. In France a little tartaric acid is added to the solution of muriate of manganese before thickening it wi gum, of which one pound and a quarter are used for two quarts of the liquid, at a sp. gr. of 1·075.

Catechu brown, called carmelite by the French. In one gallon of water boil one pound of powdered catechu till the liquor is reduced to half its bulk; pass it through a very fine sieve; dissolve in the filtered liquor four ounces of verdigris, and let the solution cool. Thicken with five ounces of starch, and while still tepid dissolve in it five ounces of powdered sal ammoniac. Print this dye on the goods, and after a few days pass through the rinsing apparatus.

The second style of calico-printing consists in giving a general dye to the cloth, and discharging portions of the ground, which has the effect of producing a number of white or variously coloured figures upon it. Discharges are of two kinds: the simple, and the compound or mordanted.

1. Discharge on a Turkey red ground. For the communication of this beautiful fast colour to cotton cloth, see DYEING.

The elegant style of simple and mordanted discharges of Turkey red cloth was invented many years ago by MM. Kœchlin, of Mülhausen, and introduced into this country by Mr. Thomson, of Primrose, near Clitheroe. An excellent white discharge paste is made by the following prescription: dissolve in two quarts of water three-quarters of a pound of oxalic acid and a pound and a half of tartaric acid, and add to the solution two quarts of lime juice concentrated to sp. gr. 1·230 (46° Tw.) Thicken with six pounds of pipe-clay and three pounds of gum. This is to be applied with the block or the cylinder-machine. The piece after being dried is passed through a bath of solution of chloride of lime of the following construction:—

A cistern of wood, frequently lined either with zinc or lead, about five feet square, and six feet deep, is furnished with a square wooden frame-work, bearing a series of parallel rollers in two ranges from top to bottom; which frame may be let down into the cistern, and lifted out at pleasure by the help of a pulley and counterpoised cord. The cistern is to be filled with a solution of chloride of lime, having a specific gravity of about 1·040 (2° Tw.), and a proper decolouring force by the indigo test. Before entering the goods, the bath should be stirred up a little. The calico-pieces, stitched together lengthwise, are now by means of a guiding-cord led serpent-like over the respective rollers in horizontal planes, and are drawn through by a pair of squeezing-rollers at the opposite side to that where they entered. The cloth should be exposed to the action of the chloride liquor during a space of three minutes, by the equable motion of the drawing-rollers; and on its escape from them should be allowed to fall into a cistern of water, or be passed through the rinsing apparatus.

Common madder reds and pinks are discharged in another way. The goods are passed through the acetate of alumina liquor in the trough of the padding-machine, called *foulard* by the French, whereby they are prepared for the madder-bath. They are dried, and then impressed with the discharge paste by means of the engraved block or cylinder. This paste consists of concentrated lime-juice, properly thickened with pipe-clay and gum. Sometimes a little tartaric acid is added, or even bisulphate of potash for the sake of economy. This mordant is also sometimes applied before passing the cloth through the padding-machine; a practice supposed to produce the clearest whites, as the mordant in this case is never [illegible] to attach itself to the places intended to be white. If cloth so treated be subjected to dyeing in the madder-copper, its ground will come out red; if in the madder and logwood-copper, it will come out reddish brown; if in the cochineal, it will come out a beautiful pink; and in the logwood alone, a chocolate; with logwood and galls, black.

If, after applying the above discharge-paste by the block or cylinder, the goods be padded with iron-liquor or a mixture of iron and aluminous liquor, on dyeing them up in the madders, or other coppers, prints with various dark grounds will be obtained, enlivened by white figures. The best discharges upon manganese or bronze grounds consist of the acidulous nitro-muriatic solution of tin, or salt of tin. To two quarts of water, made into a paste with nine ounces of wheaten flour, add, when cold, from half a pound to a pound of muriate of tin crystals, according to the depth of the manganese tint to be discharged.

Compound discharges not only remove the mordant from the ground wherever they are applied, but introduce a new mordant upon the discharged points, so as to lay the foundation for these points receiving peculiar colours in the subsequent dyeing or padding operations. When mordanted goods are intended for the discharge process, they should not be much exposed to the air, as the mordant becomes thereby of too fixed a nature to be completely removed. Nor should they be washed out before the piece receives the discharge; for it ought to be kept in mind, that passing the goods through either the dung-bath or even chalk and water, tends to fix the mordant too firmly for the perfect action of the discharge. After receiving the discharge-paste from the block or cylinder, the goods should be hung up in a cool place; for if suspended in a hot chamber the effect of the discharge will be impaired. After exposure for about 21 hours, more or less, according to the nature of the discharge, they must be subjected, at the rinsing-roller machine, to water heated to about 140° Fahrenheit, and mixed with a little chalk or carbonate of soda, just enough to saturate the acidulous washings. They are then washed in cold water, next dunged, and finally dyed up in the proper copper.

Violet ground with red-and-white figures.—Pad with very weak iron-liquor; dry moderately; print on the cloth with the one cylinder of the two-colour machine the red liquor mordant properly acidulated with concentrated lime juice of specific gravity 1·240 (48° Tw.), and with the other cylinder the discharge-paste strengthened with tartaric and oxalic acids. After drying, rinse the goods through chalky water; dung, and dye in the madder-copper, and clear them as already prescribed.

Grey ground with pink figures.—The grey is first given with decoction of galls and nitrate of iron, applied the one after the other. The discharge-paste is made by thickening two quarts of a strong decoction of Brazil wood or peach-wood with nine ounces of flour, and adding to the paste when cold ten ounces of solution of tin, made by dissolving salt (muriate) of tin in twice its weight of muriatic acid.

Chrome-yellow discharge upon Turkey-red ground.—Take 2 quarts of lime-juice of specific gravity 1·09; dissolve in it 2 lbs. of tartaric acid, 2 lbs. of nitrate of lead; thicken with 3 lbs. of pipe-clay and 1½ lbs. of gum, each previously pulverized. Tinge the mixture with a little chromate of potash, to indicate its nature. Most mordants are faintly coloured for that purpose. After applying this paste as above prescribed for the white discharge, pass the goods through the bath of chloride of lime, and rinse; then pad with bi-chromate of potash, which converts into a brilliant yellow all the figures to which the discharge-paste has been applied.

Green discharge of Turkey-red ground.—To the above discharge for chrome-yellow add 12 ounces of Prussian blue colour, prepared by mixing 5 lbs. of Prussian blue in powder with 6 lbs. of muriatic acid, and diluting the mixture after 24 hours' digestion with 4 lbs. of water.

Bi-chromate of potash may be employed as a discharge. After having dyed the goods in the indigo vat, they are to be padded in a bath of bi-chromate of potash, containing from 1 oz. to 1½ oz. of the crystals per quart, according to the depth of the blue to be discharged. Dry in the shade without heat, and print on the following discharge:—dissolve in 2 quarts of water 1 lb. of oxalic acid, 8 oz. of tartaric acid, and thicken the solution with 3 lbs. of pipe clay and 1½ lbs of gum, adding to the whole 4 oz. of muriatic acid. After this paste is printed on, the goods must be rinsed through chalky water heated to 145° Fahrenheit, then washed in clear water, and passed through very dilute sulphuric acid.

The bi-chromate acts here a similar part to chloride of lime, for wherever the roller applies the acidulous paste there is an immediate white discharge, with the disengagement of a peculiar odour.

III. *Resist Pastes.*—This name in England, and *reserves* in France, is given to the substances which possess the property of counteracting the indigo-vat dye, in the spots to which they are applied to cloth. They have been divided into four classes:—those of a fatty nature; those with a basis of metallic salts; the coloured reserves, capable of communicating different colours in the course of their application; and lastly, mordant reserves, which form the *lapis lazuli* style. The first are used only in silk-printing.

After printing on the resist pastes, the goods should be hung up in rather a damp than a dry atmosphere.

White resist for deep blue, to be applied by the cylinder.—Dissolve in 3 quarts of water 1¼ lb. of acetate of copper in crystals, and 5 lbs. of sulphate of copper, adding thereafter 3 lbs. of acetate of lead; thicken with 5 lbs. of gum, and add to the whole [illegible] lbs. of sulphate of lead. Print on with this paste; hang up for two days, and dip it during two hours, by repeated immersions, in the blue-vat. Finally, pass through very dilute sulphuric acid to clear up the white figures.

Chrome-yellow resist.—Dissolve in two quarts of water 1½ lb. of nitrate of lead, ½ lb. of the acetate of copper (vulgarly called distilled verdigris): add to the solution one pint or nearly so of a saturated solution of subacetate of lead; thicken with 1½ lb. of gum and 3 lbs. of pipe-clay. Triturate the whole together, and pass through a sieve.

After printing on this resist paste, the goods must be hung up for two days, and then dipped in the proper blue-vat; for the composition of which see DYEING. Steep the goods in water for half an hour, then rinse out slightly, and pass through a trough 12 pailsful of tepid water holding half a pound of soda crystals in solution. Turn over for a quarter of an hour, and rinse again. Now pass the goods for half an hour through a solution of bi-chromate of potash, containing 5 oz. for every piece; rinse; and, in order to separate the paste, pass through muriatic acid largely diluted with water, till the yellow hue comes fully out. Wash and dry.

The Lapis Lazuli style. Resist for a full-bodied red.—Dissolve in two quarts of red liquor, specific gravity 1·09, 2 oz. of corrosive sublimate, and thicken with 2 lbs. of pipe-clay and 1 lb. of gum, adding 4 oz. of olive oil. This and other coloured reserves are to be printed upon the cloth with the three or four-coloured calico-machine; four days thereafter give the pieces, at different periods of ten minutes each, successive dips in the blue vat of the desired hue, with alternate exposure of them in the air also of ten minutes, according to the blue tint in demand. Rinse in a stream of water for half an hour.

Into a copper nearly filled with water put two pailsful of bran; make the contents boil; then add cold water to lower the temperature to 180° Fahrenheit. Enter the goods, and winch them during twenty minutes in the bran-liquor; remove and rinse them; pass them next through a trough containing sixteen gallons of water acidulated with three quarts of vinegar, and thereafter wash to prepare for the maddering, which is to be done with the precautions already prescribed, taking care not to raise the heat of the madder-copper above 190° Fahrenheit. The lapis style of goods must be finished with a bath of bran and exposure on the grass, twice or oftener alternated if necessary, to bring out the lustre of the colours. A little soap-water aids in the brightening.

Though China blues differ in their principle of application, they may be considered most conveniently under this head. The blue colour is prepared by grinding 16 lbs. of indigo, 3¾ lbs. of orpiment, 22 lbs. of copperas, with 5½ gallons of water, in the common indigo mill during three days. A part of this paste is to be thickened with strong gum-water in successive degrees of dilution, and a part [illegible] reserved unmixed. Take three different shades of blue, [illegible] darkest being thickened with starch, and the pale with gum, and apply them by the cylinders of the three colour machine. Hang up the pieces for two days in an airy place not too dry, and then proceed to dip them as follows:—three cisterns must be charged; the first with 300 lbs. of lime for 600 pails of water; the second with a solution of sulphate of iron (green copperas), at a density of 1·048 (9¾ Twad.); the third with a solution of caustic soda lye, at a density of 1·055 (11 Twad.), prepared from soda crystals and quicklime with water. The pieces being stretched on the frames, are to be dipped into the vat No. 1, and left there for ten minutes; they are then withdrawn, and allowed to drip during five minutes. They are now dipped in vat No. 2, for ten minutes, and taken out to drip for five minutes. The following table will place the series of operations in a clear light.

Dip in the vat.	During ten minutes.	Drip for five minutes.
1 . .		

In the dipping of China blues care should be taken to swing the frames during the operation. After the last dip, the frame with the piece upon it must be immersed in a fourth vat, charged with sulphuric acid of specific gravity 1·027 (5⅜ Twad.). The object of this immersion is to remove the oxide of iron deposited upon the surface of the cloth in its successive passages through the lime and copperas vats. It is next exposed for an hour to a stream of water, and finished by the action of a tepid bath of sulphuric acid of specific gravity 1·027. The blues are afterwards enlivened by a feeble soap bath, at a heat of 145° Fahrenheit.

The theory of China blues is one of the most beautiful developments of modern chemistry. The indigo and sulphate of iron imprinted at first on the cloth exercise no mutual action upon each other till the cloth is plunged into the lime-water vat. Here a portion of the sulphate of iron is decomposed, and its protoxide is rendered free to de-oxidize the indigo, and to render it soluble in the lime-water. In this dissolved state its particles can penetrate the textile tissue, combine with its filaments, and on exposure to the air become a fixed insoluble blue. On dipping the cloth into the second copperas vat a new layer of oxide of iron is formed on the whole of its surface, which oxide operates only on the indigo spots, de-oxidizing another portion of the indigo, which becoming soluble is removed at the second dip into the lime-vat. By these alternations successive deposits of oxide of iron and sulphate of lime ensue, for the separation of which from the cloth the frame needs to be agitated in the lime-vat. In the copperas vat, on the contrary, the frame should be kept motionless, to favour the deposition of as much oxide of iron as possible upon the indigo points. From these circumstances we may account for the accidents which frequently befall the China blue process in unskilful hands. The blues sometimes scale off, from the paste being dried too hard before the goods are dipped. When the temperature of the vat-liquors is too low, the blues get a grey tint, and are always dull.

IV. *Steam-Colours.*—This modern style combines with the beauty of colour such a degree of solidity as can be obtained only by the madder copper. An example will illustrate the mode of procedure. The goods are to be padded in the following mordant at a sp. grav. of 1·047. In 30 gallons of boiling water dissolve 30 lbs. of alum, 5 lbs. of dry carbonate of soda, and 15 lbs. of acetate of lead. After mixture and subsidence, draw off the supernatant acetate of alumina. After being padded, the goods are to be dried over the hot flue, and, after being hung up three days, they are to be washed in chalky water at 133° Fahr., then rinsed in clear water and dried. The goods should be smoothed by the calender before being printed.

Preparation of mordant for steam-colour:—

Dissolve in 7 gallons of boiling water 10 lbs. of alum, 5 lbs. of acetate of lead, and 20 oz. of sal ammoniac. Let the mixture settle, and decant the supernatant liquor, of sp. gravity 1·075. Thicken with gum.

Black figures are given by printing-on the following paste. In two quarts of strong decoction of logwood, thickened with 8 oz. of starch, dissolve, while tepid, 2 oz. of sulphate of iron. Pour into a pipkin containing 1 oz. of olive oil; stir, and when it is cold, add 4 oz. of nitrate of iron containing a little acetate.

Full-bodied Red.—Thicken 2 quarts of a strong decoction of peach-wood by boiling 8 oz. of starch in it; when cold, add 12 oz. of solution of nitro-muriate of tin.

Steam-Blue by Prussiate of Iron.—In 1 quart of water dissolve 3 oz. of oxalic acid, or 3¼ oz. of tartaric; and in another quart dissolve 6 oz. of prussiate of potash. Mix these two solutions, let them settle during 24 hours, decant the clear supernatant liquor, and thicken it with 1¼ lb. of gum.

Steam-Green paste is prepared by adding to the preceding blue a strong decoction of Persian berries, mixed with the above aluminous mordant containing sal ammoniac, and thickened. The proportions of the yellow and blue pastes determine the shade of green.

The supernatant liquid of the blue formula contains ferro cyanic acid, convertible, by the steam-heat and the agency of the vegetable acid, into Prussian blue, which fixes on the cloths.

Lemon-Yellow.—Two quarts of a decoction of Persian berries, made from 2 lbs. of berries, 2 quarts of the above mordant with sal ammoniac, thickened with 3 lbs. of gum.

The goods, after having one or more of these or other such colours printed on them with the cylinder machine, should be suspended for two days in a chamber of a temperature not exceeding 88° Fahr. The colours are afterwards raised and fixed by the application of dry steam; for any aqueous condensation would spoil the prints. There are five kinds of apparatus for applying steam in steam-colour printing. 1. The column or cylinder; 2. the lantern; 3. the cask; 4. the steam-chest; and 5. the chamber. We shall content ourselves with describing the column, as it is most generally used in this country. It is a hollow cylinder of copper from two to six inches in diameter, and about forty-five inches in length, perforated along its whole surface with small holes about one-sixteenth of an inch in diameter, and one quarter of an inch apart. To the lower end of the column a circular plate is soldered of about nine inches diameter, which serves to prevent the cloth coiled round the cylinder from falling down from it. The bottom of the hollow cylinder is terminated by a tube one inch wide, which fits tight into the socket of an iron chest beneath it, into whose side the steam-pipe of supply enters. The water condensed from the steam is also received into that chest, and may be run off by means of a stop-cock near its bottom. In some columns the steam is admitted at the top, and the condensed water is allowed to run off by a small syphon tube at the bottom. The goods printed with the above steam-colours and properly dried are lapped tight round this hollow cylinder and covered exteriorly with an envelope of strong cotton cloth, blanket-stuff, or flannel. The steam is then let on, and continued for 20 or 30 minutes, according to the nature of the dyes. The steam being stopped, the printed goods are rapidly unrolled from the column while still hot, lest any condensation of vapour should take place to stain them.

V, *Spirit-Colours* are brilliant, but fugitive; they consist generally of decoctions of dye-woods, mixed with nitro-muriate or muriate of tin. The following red will serve as an example. Thicken two quarts of decoction of peach-wood with four ounces of starch; dissolve in the paste while hot four ounces of alum; add to the mixture when cold four ounces of oxymuriate (perchloride) of tin, and two drams of sulphate of copper.

This and such colours are applied by the two, three, or four-coloured printing machine, and passed through a drying room slightly heated. The goods are next tenderly rinsed in running water; afterwards washed, and dried quickly, but with a moderate heat.

Though this article has extended much beyond the limits originally proposed, it has left untouched a vast variety of subjects in this the most interesting, curious, and refined of all the chemical arts.

CALICUT, a seaport town in the province of Malabar, in 11° 15′ N. lat., and 75° 50′ E. long. Calicut was the first Indian port visited by Vasco de Gama in 1498. The name of the place is properly *Colicodu.* Dr. Hamilton (Buchanan) gives the following account of the origin of this name:—'When Cheruman Permal (the first monarch of Malabar) had divided that country among his nobles, and had no principality remaining to bestow on the ancestor of the *Tamuri*, he gave that chief his sword, with all the territory in which a cock crowing at a small temple in the town could be heard. This formed the original dominions of the Tamuri, and was called Colicodu, or the cock-crowing. This place continued to be the chief residence of the Tamuri rajahs until the Mussulman invasion, and became a very flourishing city, owing to the success that its lords had in war, and the encouragement which they gave to commerce.'

In 1766 the town was taken by Hyder Ali, when he enlarged the fort. His son Tippoo afterwards destroyed both the fort and the town, and removed the inhabitants to Nelluru, the name of which place he changed to Furruckabad. When the province of Malabar was conquered by the English, in 1790, the former inhabitants of Calicut returned to their old abode. Before its destruction by Tippoo the town contained between 6000 and 7000 houses. Towns in India are very speedily established; and in 1800 Calicut again contained more than 5000 houses. The inhabitants are mostly Moplays, who are of Arab descent and profess Mohammedanism.

The manufacture of cotton goods was formerly carried on here to a great extent and furnished a considerable supply of those goods to Europe; but at this time the manufacture is so far fallen off that the greater part of the clothing used in the country is imported. The exports now consist principally of coco-nuts, betel-nuts, pepper, ginger, turmeric, teak-wood, sandal-wood, cardamoms, and wax. The town is 129 miles S.W. of Seringapatam, travelling distance.

(Rennell's *Memoir of a Map of Hindustan*; Mill's *History of British India*; Dr. Hamilton (Buchanan's) *Journey through Mysore, Canara, and Malabar.*)

CÂLIDÂSA, is the name of one of the most admired Indian poets. Hardly anything is known concerning the circumstances of his life. A tradition, very generally believed in India, makes him one of the *nine gems* or distinguished poets, who lived at the court of king Vicramâditya. If by this name the same sovereign is to be understood from whose reign (B.C. 56) the years of the Samvat æra are counted, Câlidâsa must have flourished about the middle of the century preceding the commencement of our æra. Another king of the name Vicramâditya ascended the throne in A.D. 191, and a third in A.D. 441; and several considerations, especially the highly-polished style in which the works attributed to Câlidâsa are written, favour the assumption that the poet lived under Vicramâditya II. At all events our author must be distinguished from a poet of the same name who lived in the twelfth century at the court of Râjâ Bhôja, the sovereign of Dhârâ. The Nalôdaya, a Sanscrit poem on the subject of the story of Nala and Damayanti, from the Mahâbhârata, written in an exceedingly forced and artificial style, full of rhymes and plays upon the sound of words, to which the name of Câlidâsa is affixed, should probably be attributed to the Câlidâsa of Râjâ Bhôja's court. Persons who are at all conversant with the literature of the Hindus must be aware of the almost total absence of all historical records in the Sanscrit language, and will not therefore be surprised at our being as yet unable to offer anything beyond a guess as to the epoch indicated by the tradition concerning the greatest poet that India ever produced. Further inquiries will doubtless throw additional light upon the subject; and it is to be hoped that when Sanscrit literature shall have been drawn to light and critically examined to a greater extent than has hitherto been done, a chain of internal evidence will be formed, sufficiently strong to determine the relative age and, approximatively, the date to be assigned to the principal extant works written in Sanscrit.

But however imperfect in these respects our information about Câlidâsa may be, we possess in his works abundant evidence of the power of his genius. We do not hesitate to pronounce him the most universal, the least constrained by national peculiarities, not merely of all Indian, but of all Asiatic poets with whose works we are acquainted; and to this elevated tone of his mind, which while seeming to breathe the purely human air of Greece, yet retains all the quickness and glow of feeling, all the vividness of description and imagery of the Hindu, must in our opinion be mainly attributed the undivided admiration with which the translation of his drama, Sacuntalâ, by Sir William Jones (the first work that made known the name of Câlidâsa to Europeans), has been everywhere received. This translation appeared for the first time at Calcutta in 1789, but was soon reprinted in England, and was from the English, at an early period, retranslated into several other languages of Europe. We may particularly notice the German translation by George Forster, who appended to it a glossary explanatory of the allusions to Indian mythology, natural history, &c. The popularity which the play has acquired on the continent is attested by the fact that several attempts have been made to adapt it to the stage. In 1830 the Sanscrit text of Sacuntalâ was published at Paris from a MS. belonging to the *Bibliothèque du Roi* by the late Professor A. L. Chézy, with an original French translation; and upon this edition is founded a new translation into German by M. Hirzel, Zürich, 1833, 8vo., in which the various metres of the text are imitated. Both Sir William Jones's translation and Chézy's edition have however been lately found to exhibit the work of Câlidâsa according to the interpolated shape in which it is now current in Bengal. This discovery was made by Mr. Hermann Brockhaus, of Leipzig, who, in 1835, examined and collated the numerous MSS. of the drama in the library of the East India Company, and in the private collection of Professor H. H. Wilson at Oxford, and to whom we hope we may soon be indebted for a new edition of the play according to the unadulterated text, in which it has been preserved by the Benares school of Pundits.

We must confine ourselves to a mere enumeration of the other principal works of Câlidâsa. Besides Sacuntalâ we possess two other dramatic poems attributed to him,—Vicramôrvasî, founded upon an antient Indian legend of the loves of king Jurûravas and Urvasî, a celestial nymph (translated by H. H. Wilson, in his Hindu Theatre; the text printed at Calcutta in 1830, and critically re-edited with a Latin translation by Lenz, Berlin, 1833, 4to.), and Dhûrtasamâgama, a burlesque piece, as yet inedited. The Mêgha dûta, or 'Cloud-messenger,' a lyrical poem of only 116 stanzas, contains the complaints of a demigod banished to earth, who entreats a passing cloud to convey an affectionate message to his wife. It was edited with a translation into English verse and with notes by H. H. Wilson, Calcutta, 1813, 4to. The Raghu Vansa is a narrative poem in celebration of the family of Raghu, in which Râma, the hero of the Râmâyana, and as the incarnation of Vishnu an object of great veneration with the Hindus, was born: it has been edited, with a Latin translation, by Stenzler, London, 1832, 4to., and with a Sanscrit prose paraphrase by the pundits of Fort William at Calcutta, 1832, 8vo. The Cumâra Sambhava is another epic poem designed to celebrate the birth of Cumâra, the son of Pârvatî; but it appears that either it never was completed, or that it has not been preserved entire, for at present it closes with Pârvatî's wedding. An edition and translation of this work by Stenzler is announced as preparing for publication under the auspices of the London Oriental Translation Fund. Part of the first canto is given in Sanscrit and English, and with interesting annotations by (we believe) the Rev. Dr. Mill, of Calcutta, in the Journal of the Asiatic Society of Bengal for July, 1833, pp. 329-358. A short didactic poem on prosody, exhibiting the most common sorts of metre, and called *Srutabôdha*, is likewise attributed to Câlidâsa.

CALIDRIS. [CHARADRIADÆ.]

CALIFORNIA is situated on the shores of the Pacific Ocean, and forms the N.W. portion of the United States of Mexico. It consists of two parts, Lower California, a peninsula, divided from the mainland by the Gulf of California, and extending from the Cape of S. Lucas (22° 45′ N. lat.) to the N. extremity of the Gulf (about 32° N. lat.); and Upper California, which comprehends the whole coast extending farther N. to 42° 30′ N. lat., where it borders on that part of the United States which lies on the Columbia River.

Lower California may be considered as one continuous mass of high, bare, and steep rocks, with numerous ravines intersecting them. With the exception of two or three places, it hardly contains any level ground that can be called a valley. Nearly all the places which contain a small tract of cultivable ground are on the E. declivity of the mountains: the western side generally sinks with a steep descent to the shores of the Pacific. Towards the northern extremity of the Gulf, from about 30° N. lat., the mountains recede to a considerable distance from the shore, and leave a large tract of flat country between them and the sea; but this surface, being composed of fine sand, is entirely sterile.

The bareness of the rocks is chiefly owing to the climate, which is exceedingly dry and hot. Only the southern portion has the annual rains, which last for six weeks, or two months, in September and October. At Loreto (about 25° 30′ N. lat.) it does not rain every year, but only at intervals of from five to six years, when the rains descend in great abundance, but do not last for a long time. Farther north it never rains, at least so far as is known. The heat is excessive. The thermometer is known to rise to 106° Fahrenheit, and even 110° and more, which however is probably caused in part from the reverberation of the sun's rays from the bare rocks. We are not informed how low the thermometer descends, but probably never much below 80°. Lower California may consequently be considered one of the hottest countries of America.

Earthquakes are not known; but there is a volcano near 28½ N. lat., in a group of mountains called Castres Virgines.

The vegetation is very scanty. The number of trees is small, but some of them are valuable, such as the mesquito tree, on whose leaves cattle feed when there is no grass, which happens very frequently. The bark of some is used for tanning, and others produce edible fruits, which grow very well in the hot and dry valleys, especially figs, quinces, olives, dates, and vines, which have been introduced by the Spaniards. A good sort of wine is made. In a few places Indian corn, mandioca, and some other plants, are cultivated; but the produce of these spots is not sufficient for the consumption of the scanty population, and therefore Indian corn and wheat are brought from the mainland and exchanged for fruit, spirits, soap, salt, pearls, and tortoise-shells.

Cattle, horses, and mules are rather numerous in proportion to the population. They pasture on the mountains when grass is to be found, and at other times feed on the leaves of the mesquito-tree. Hogs are still more numerous, and fatten upon snakes. Among the wild animals are wolves, foxes, deer, and different kinds of goats, of which one, called *berenda*, is distinguished by enormous horns, and resembles the mouflon (*ovis Ammon*) of Sardinia. Ground-squirrels, rattle-snakes, lizards, and scorpions abound.

The mineral riches are very inconsiderable. Only one mine is worked, about ten or twelve miles N.W. of La Paz, where gold is extracted, but the metal is not abundant. It is supposed that the western declivity of the mountains contains a considerable quantity of minerals, but if this be the case, they will probably never be worked, as this part of the peninsula is quite uninhabitable.

Though Lower California was discovered by Hernando de Grixalva in 15[illegible], no settlement was formed by the Spaniards before 1698, when the Jesuits established themselves here, and began to collect the wandering Indians into their missions, and to convert them. But the population was of course very scanty, and so it is still. All the inhabitants of the eighteen missions probably do not exceed 4000, and perhaps about an equal number live out of the limits of the missions. The Indians belong to several tribes, of which the Pericues, Monquis, and Colimios are the most known. They speak different languages, and go nearly naked.

Loreto is considered the capital of Lower California. It stands in a valley about 2000 or 3000 feet wide, and surrounded by wild and sterile mountains, of which La Giganta (the giantess) perhaps rises to 5000 feet. The valley contains only the town, which is small, and inhabited by about 250 persons; and two gardens, which belong to the community, and whose fruits supply the principal article of trade. Its anchorage is open to the winds from N.N.W. and S.E.

In the vicinity of La Paz, farther to the south, is a considerable quantity of cultivated land, and the gold mine of S. Antonio. At this place fruit and vegetables of excellent quality are raised. Its whole population is about 2000. The harbour of Pichiluigo, which lies near La Paz, is good, but only small vessels can enter it, the water being shallow.

Upper California, in its western districts, which are the only parts known, in some degree resembles Lower California. The E. boundary-line of this country is not determined, but, according to the prevailing opinion of the Mexicans, it extends E. as far as the range of the Rocky Mountains, near 109° W. long. Its W. point, Cape Mendocino, is about 124° W. long. Thus this country would extend towards its N. extremity (40° N. lat.) nearly 800 miles from E. to W., and nearly as much from S. to N. But within these boundaries extensive countries are comprised, which so far from being settled by whites, are hardly visited by them, and are nearly unknown to geographers. This observation applies especially to all those wide-spreading countries which extend along the numerous branches of the Rio Colorado. They have only been seen by a few wandering missionaries, who have given very unsatisfactory accounts of them. Even the mountain-range which bounds the basin of the Rio Colorado on the W. is so little known as to its extent and direction, that it cannot be laid down on a map. To the W. of this chain extends a sandy desert, from the N. extremity of the Gulf of California to the northern boundary of Mexico (42° 30′), consequently about 700 miles in length. Its breadth at the southern extremity is about 100 miles, but it grows wider as it advances N., and may in some places be 200 miles and more across. Our information is limited to that portion of Upper California which, lying between this desert and the shores of the Pacific extends about 120 or 150 miles inland.

The mountain masses which constitute the peninsula of Lower California extend undivided as far N. as 34° N. lat. to the snow-capped peak of S. Bernardino, whose height has not yet been determined. North of this summit the mountains divide into two great ranges, both of which run N.W., and include between them the extensive valley of the Tule Lakes. The chain, which runs on the N.E. of the valley and divides it from the great desert, rises to a great height, a considerable part of it being covered with snow all the year round, which, between 36° and 37° N. lat., implies an elevation of about 10,000 feet above the level of the sea. But, except this circumstance, we are entirely unacquainted with these mountains. It is supposed that at 38° N. lat. they decline to the N.E., and join the Rocky Mountains in 40° or thereabouts. The range which extends to the S.W. of the valley of the Tule Lakes, and divides it from the seabord, has its principal chain close to the valley, but several ridges branch off from it to the W., and thus form a number of longitudinal valleys, which are generally of very moderate width. The most remarkable is that ridge which branches off near S. Ines (35° N. lat.), and separates the Rio Buenaventura, or the Monterey river, from the coast. The mountains on the S.W. of the Tule Lakes terminate at the S.E. extremity of the bay of S. Francisco.

The two Tule Lakes occupy a considerable portion of the valley, extending about 100 miles in length, but their width is not known. At the end of the dry season they have so little water, that they are fordable at several places. Shortly after the rains, and whenever the snow on the adjacent mountains is melting, these lakes discharge a considerable volume of water by the river, which falls into the most S.E. corner of the Bay of S. Francisco; but after the vernal equinox the quantity of water thus discharged is very inconsiderable. The mountains which enclose the valley on the S.W. seem to advance close to the banks of the lakes; but those on the N.E. are at some distance, so that a tract of level or undulating land lies between them. This tract seems to be fertile, but is not yet cultivated, no agricultural establishment having been formed here.

The only settled part lies along the coast, the missions being nearly all within one day's journey from it. The settlements are generally not extensive, the valleys being in general narrow, and the mountains which enclose them too steep to be cultivated, though they supply pasture for a considerable part of the year. The most extensive valley is that of S. Gabriel, which is above 30 miles long, and of considerable width to the W., where it approaches the coast, and joins on each side the plains of S. Fernando and S. Luis Rey. The mountains are separated from the coast by a tract covered with low sand-hills, which in some places extend many miles inland.

The country about the Bay of S. Francisco seems to be the best portion of Upper California. Its soil is doubtless inferior to that of the valley of S. Gabriel, but the cultivable land occupies a much greater extent along the banks of the three rivers S. Joaquin, Jesus Maria, and Rio Sacramento, which fall into the bay. But the settlements in this part are not yet numerous.

Upper California partakes more of a cold than of a warm climate. The rainy season is from November to February. The rain is abundant in the northern districts, but decreases in quantity farther S.: at S. Diego, the southernmost of the missions, probably no rain at all falls, as in the N. of Lower California. The winter is much milder than in the same latitude on the E. coast of America. It does not appear that the Tule Lakes are ever covered with ice, nor is frost frequent in the valleys, though the surrounding heights are covered with snow for a few months. The summer is very dry, no rain falling at all, except at Monterey, where there are sometimes, but rarely, slight showers. The heat is great, and the thermometer probably rises to 80° and more; but exact observations are wanting. On the banks of the Rio Colorado, at the extremity of the sandy desert, Dr. Coulter observed the thermometer rise to 140° in the open air.

The surface of Upper California being mostly covered with rocky mountains contains a very small proportion of arable land, but where the soil is arable it is usually rich. Maize and wheat are extensively cultivated: the former yields from seventy to eighty-fold, and the latter about seventeen-fold. Vines, and all kinds of fruit-trees that have been tried, thrive remarkably well, though they are sometimes destroyed by the locusts, which appear to breed along the coast in the sand-hills, and are carried inland by the strong N.W. winds. Most of the vegetables of Europe, especially the leguminous vegetables, grow well about the Bay of S. Francisco.

Black cattle form the principal article of produce. Though they were brought to California only seventy years ago, in 1827 the missions possessed 210,000 branded cattle, and it was supposed not less than 100,000 unbranded. About 60,000 are annually killed, and the hides, which are salted, form the principal and nearly the only article of export. Sheep are also numerous, but wool has not yet been exported. Horses and mules are only reared so far as is requisite for the consumption. Among the wild animals two are remarkable, the berenda, and an animal of the deer kind, which is distinguished by its great size, large horns, and great swiftness.

In minerals Upper California is not rich. A small silver mine was found E. of S. Ines, but it has been abandoned. In one of the rivers falling into the southern Tule Lake some gold has been found, but as yet in very small quantity.

Humboldt estimated the population of the missions of Upper California, according to official documents, at 15,600, at the end of the last century; the number of whites was then very small. Since that time great changes have taken place, and Dr. Coulter thinks the number of the white population cannot fall short of 6000, but at the same time he states that the aboriginal tribes are rapidly decreasing. According to other accounts however the number of the converted Indians amounted to 21,840 in 1824.

According to the missionaries, not less than seventeen different languages are spoken along the coast between S. Diego and S. Francisco. Langsdorf found that the country about the Bay of S. Francisco was inhabited by seven different tribes. The converts at that mission, though amounting only to about 1500, consisted of individuals collected from twenty different tribes, speaking different languages.

There are in this country four presidios, or military establishments, in each of which a small number of soldiers is placed, under the command of an officer. Each of them has to protect a certain number of missions, the number of which at present is twenty-one or twenty-two. Each mission contains a church, the dwelling-houses for two or three monks, some public buildings for the preservation of agricultural produce, utensils, and tools, and the houses of the converted Indians. The unmarried women are kept in separate houses, where they are occupied with spinning, weaving, and other manual work. Besides these missions, there are other places called pueblos (villages), in which invalid soldiers are settled with their families, and gain their livelihood by cultivating the ground.

The chief places are S. Diego, with a good but not deep harbour, whence large quantities of tallow and salted hides are exported; Monterey, the seat of the governor of Upper California, on a large bay, having good anchorage; and S. Francisco, on the bay of that name, which is very spacious, and from N.E. to S.W. extends upwards of sixty miles, with an average breadth of about twenty.

To the N. of the Bay of S. Francisco, and at a distance of about ninety miles, is the harbour of Bodega (38° 30′ N. lat.), where the Russians formed an establishment in 1812, called Ross. (Venegas, *Hist. of Californ.*; Humboldt's *Essay*; Hardy's *Trav.*; and Dr. Coulter in the *London Geogr. Journal*, vol. v.)

The BOTANY of California is not much known; it appears however to be of a very peculiar character. The follow-

[illegible] remarks apply nearly altogether to Upper California. Some noble pines, especially one called Pinus Sabiniana, with hard woody cones of an unusual size, have been discovered there; and herbaceous plants are in some instances strikingly different from those of any other country. Large numbers of Polemoniaceæ, especially beautiful species of Leptosiphon and Gilia; some curious plants belonging to the genera Nemophila and Emmenanthe; several new genera of Papaveraceæ, particularly Dendromecon, which is a shrub (!) looking like a Cistus; many kinds of Eschscholtzia, of Lupinus, of Pentstemon; an Onagraceous plant, intermediate as it were between an Epilobium and a Fuchsia, the Zauschneria Californica of Presl; and, finally, several kinds of Calochortus, Cyclobothra, Calliprora, Brodiæa, and other bulbous plants, stamp the vegetation with a character quite unlike that of any other part of America.

CALIFORNIA, GULF OF, which was first visited by Hernando de Grixalva in 1534, extends along the W. coast of America, between the mainland and the peninsula of California, beginning on the S. between Cape Palmo in California (about 23° 10′) and the port of Mazatlan on the mainland (about 23° 30′), and extending N.W. to the mouth of the Rio Colorado (32° N. lat.). Its length is above 700 miles, and its breadth varies between 150 and 40 miles. To the N. of 27° it is hardly more than 80 miles across at any place.

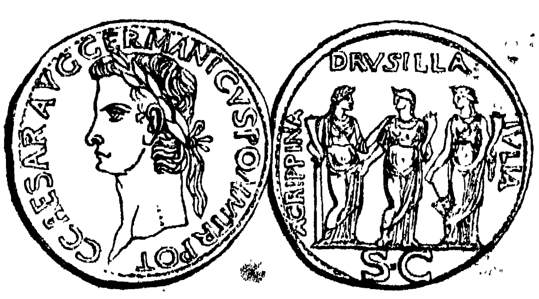
Its W. shores are in general rocky and high, except to the N. of 30°, where the coast is sandy and flat. This low coast continues on the E. side of the gulf to the island of Tiburon, where it begins to be somewhat higher, and continues so as far as the mouth of the Rio Yaqui. From this point to the vicinity of Punta Arriсifes the coast is again low and sandy. At the Punta Arricifes it is rocky, and lined with cliffs. Between this cape and the port of Mazatlan it is of moderate height, but in general not rocky.

This gulf contains pearl-fisheries. At the end of the sixteenth and the beginning of the seventeenth century a great number of valuable pearls were collected, but this branch of industry soon began to decline, and was almost entirely neglected. Different reasons were assigned for this circumstance, but we now know the true one. The pearl-beds were in a short time so exhausted or destroyed, that at present it does not pay the cost of bringing them up. The whole annual produce probably does not much exceed 100*l*. The pearl-banks are all situated along the high coast of Lower California, and none of them occur to the N. of 38° 30′. Salt is found in a lake on the island Del Carmen, which lies to the S.E. of the mission of Loreto in California. The island is uninhabited; but the inhabitants of Loreto and the other missions go there to collect it and to take it to the mainland.

seems to be plentiful, and among them are some enormous size, which are much dreaded by the pearl-divers. These are especially the *meros*, *tintareros*, and the sharks. The sharks, as well as seals, are most numerous to the N. of the island of Tiburon. Turtles and tortoises also abound, principally along the shores of the mainland N. of Tiburon, where the shells of the latter are collected by the Indians. The aborigines who inhabit these coasts avail themselves of the abundance of fish, but the white inhabitants entirely neglect this branch of industry. The sea at the entrance of the gulf is much frequented by the spermaceti whale, and on that account is annually visited by a few English and American vessels.

The S. portion of the gulf is visited by a few foreign vessels, which supply the State of Occidente, and especially Sonora, with European goods, and take the produce of its copper-mines to China. These vessels go principally to the harbour of Guaymar (28° N. lat.). The same part of the gulf is also navigated by a few Mexican vessels, which carry Indian corn and maize to California, in exchange for the produce of the peninsula. A few small vessels are employed in the pearl-fishery. The northern portion of the gulf is seldom visited, the coasts being only inhabited by wandering tribes, who have nothing to offer in exchange. The navigation in the gulf is entirely interrupted in the month of September by the terrible hurricanes called cordonazos (gales), which blow at that time with great violence. (Hardy's *Travels*.)

CALIGULA, CAIUS CÆSAR, the fourth of the Roman emperors, son of Germanicus and Agrippina, was [illegible] 12, in a Roman camp, in what place is uncertain. ([illegible] brought up among the soldiers; and is best known only by a nickname said to have been given him by these associates. The word *Caligula* is derived from *caliga*, a kind of shoe, which was worn by the common soldiers, and which he frequently wore himself in order to gain their affections. (Tacit., *Ann.*, i. 41, 69.) The training and education which would have been suited to his rank appear to have been neglected. Caligula early devoted himself to observing the feelings and courting the favour of Tiberius, and by artful and unremitting attentions, he so far succeeded in ingratiating himself with the emperor, that he was soon promoted to responsible offices of state. The uncertainty of succession which followed the death of Tiberius, who was put to death probably by one of Caligula's favourites (Tac. *Ann.*, vi. 50), together with the general popularity which Caligula himself enjoyed, afforded him a favourable opportunity of succeeding to the sovereign power (A.D. 37). His government began well, and with symptoms of great clemency: he set at liberty all the state-prisoners, discouraged informers, and promised the senate that he would act with the utmost moderation: he augmented the powers of the magistrates, and at least apparently curtailed his own. Soon afterwards he assumed the consulship, and chose for his colleague his uncle Claudius. During his consulship, Caligula gave many instances of mildness and generosity: among other things, he restored the kingdom of Commagene, which Tiberius had reduced to a Roman province, to Antiochus, son of the former king. After about eight months, he fell ill, and the utmost anxiety was shown in inquiring for his health. His recovery was hailed with joy. His conduct, however, was soon changed. Caligula became addicted to intemperance and cruelty, and his extravagance knew no bounds. He took upon himself the highest titles of honour, and even had temples erected and sacrifices offered to him as a god. It seems probable that his grandmother Antonia died by his orders. According to Dion Cassius, he frequently visited the prisons in person, and ordered all the captives, untried, guilty or not, to be thrown to wild beasts. Sometimes he would order a number of the spectators to be seized and thrown among them, after having had their tongues cut out, that their cries might not interrupt his ferocious delight. Old age and weakness rather attracted than averted his cruelty. He even put to death Macro, who had been the means of his elevation, and his wife with him. A favourite horse, *Incitatus*, he fed with gilt oats and delicious wines: he appointed him a great number of attendants, and treated him with the most absurd attentions. He erected a bridge over the sea from Baiæ to Puteoli, on which he rode along, enjoying the sight of numbers of persons drowning under his order. He made great preparations for a war against the Germans, and crossed the Rhine with a large army, but returned without having seen a single enemy. He invaded and plundered Gaul, banished his sisters Agrippina and Livia, pretended that he was going to invade Britain, but returned, after he had got a few miles out to sea, and then on his arriving in Rome contented himself with an ovation. It is said that Caligula had a design to destroy the works of Homer, Virgil, and Livy.


C CAESAR AVG GERMANICVS PON M TR POT
DRVSILLA
AGRIPPINA
IVLIA
S C

[Brit. Mus. Actual size. Bronze. 450 grains.]

After a reign of three years, ten months, and eight days, and in the 29th year of his age, Caligula was murdered by a band of conspirators, headed by Cassius Chærea, a tribune, A.D. 41. (Sueton. *in vit.*, c. 69.) The character of this emperor is pretty accurately given by Seneca (*De Irâ*), where he says that nature seems to have intended to show in the instance of Caligula how much harm can be done by the greatest vices leagued with the greatest power. Perhaps the true explanation of his proceedings is that he was insane. Caligula had several wives, but he left no children behind him. The medal which is here given contains on the reverse the names of his three sisters—Agrippina (afterwards the wife of her uncle the Emperor Claudius), Drusilla, and Julia, who is called Livia or Livilla by Suetonius. (Dion Cassius, pp. 694, 717—763, H. Stephens, 1592.)

CALI'GUS (Zoology). A genus of Pœcilopodous crustaceans, separated by Müller, in which Latreille and Lamarck include the genus Pandarus of Leach, but which Desmarest places under the fourth subdivision or race of Pœcilopoda: viz. those which have fourteen feet, of which the six anterior are unguiculated, the fifth pair being bifid with the last joints fringed with fine hairs in the form of cilia.

Generic character: body depressed, having its anterior portion covered by a membranous shell in the form of a shield, narrowed posteriorly. Abdomen narrower, of an elongated oval or nearly square shape, and terminated by two elongated antennæ-like processes cylindrical and simple. There are two small conical antennæ situated on the anterior border of the head, and directed laterally, and at the internal base of these are placed the two distant eyes. Beneath the head there is an obtuse beak.

Caligus, together with argulus, and other of its congeners of the family Siphonostomata, are commonly known among the fishermen as fish-lice. But caligus is without the cupping-glass-like suckers, by which argulus adheres to its slippery supporters; and the hooks of the anterior pair of feet are the principal organs by which the former holds on to the fish.

Many naturalists have considered the tubular elongated antennæ-like processes of the posterior extremity of the body of caligus as ovaries or oviducts; and M. Surriray goes so far as to say, that having crushed these two processes in a *caligus elongatus* (?) which is very common upon the gill-cover of the gar-fish (*Esox Belone*), he extracted many transparent and membranous eggs, each inclosing a living fœtus very different from the parent. But Latreille evidently considers that there must have been some mistake, observing that he has frequently found the eggs beneath the posterior and branchial feet, but never in those tubes; and that such elongated oviducts are only seen in females, which deposit their eggs in holes or deep cavities, a habit which does not belong to caligus. Müller and others have remarked that these crustaceans raise and agitate these appendages; and Latreille agrees with the elder and younger Jurines in thinking that they minister to respiration, like the appendages at the end of the abdomen of Apus [Binoculus].

We select as an example *Caligus Mülleri*, which is found upon the common cod, *Morrhua vulgaris*.

[Caligus Mülleri, view of back.]

CA'LIPH, CA'LIPHAT. Caliph, properly *Khalîfah*, is an Arabic word which primarily denotes a deputy, lieutenant, or vicegerent, but is generally used in a more limited sense, as the title of certain dynasties of Mohammedan sovereigns, regarded as the successors and representatives of the Arabian prophet Mohammed. It was first adopted by Abu Bekr, the immediate successor of Mohammed, and, together with *Emîr-al-Mûmenîn*, 'the commander of the faithful,' continued for sever[illegible]uries to be the title of the principal line of Moham[illegible] sovereigns. The word Caliphat (Arabic, *Khilâfat*) is u[illegible] as a general designation of the line of sovereigns cal[illegible] in a geographical sense, for the extent [illegible] subject to their dominion. Disputes arose soon afte[illegible] death of Mohammed as to the right of succeeding him in the command over the faithful, and several Mohammedan dynasties assumed the title of caliphs; hence it is that we hear of a Fatimide Caliphat in Africa, and of an Omayyade Caliphat in Spain, flourishing at the same time with the Caliphat of the Abbasides of Bagdad. The word in its usual acceptation is however confined to the Eastern dynasty of Mohammedan princes. It does not enter into our plan here to attempt a sketch of the history of the caliphat, for which we refer our readers partly to general articles, such as Omayyades, Abbasides, Fatimides, and partly to the biographical notices of distinguished individual Caliphs, such as Abu Bekr, Ali, Harun, Mamun, &c. We confine ourselves, on the present occasion, to a few remarks on the administration of the empire, and on its division into provinces.

The Prophet had enjoined his followers to spread the newly-established religion by waging war against those who refused to adopt it. This command, and the spirit with which it was obeyed by the fanatic zeal of the Arabs, established, within one century after the appearance of Mohammed, an immense empire, extending from the Pyrenees to the Indus, and uniting a motley variety of nations by the profession of one uniform creed, and under the authority of a sovereign at the same time spiritual and temporal, the caliph. The power and splendour of the empire reached its greatest height during the latter part of the eighth and the beginning of the ninth century of our æra, under the caliphs Mansur, Harun-al-Rashid, and Mamun [Abbasides]: we may date its decline from the commencement of the tenth century, when many Mohammedan dynasties sprung up in different parts of the empire, who shook off their allegiance to the common sovereign; and even within the capital and the provinces that continued faithful, the authority of the caliph was diminished in consequence of the influence gained by the Emir-al-Omara, the commander of the Turkish body-guard.

Ibn Khaldun has preserved a memorandum of the annual revenue which the treasury of the caliphat derived from the several provinces of the empire during the reign of Mamun (A.D. 813—833). We subjoin a translation of this document, such as we find it in a Mauritanic MS. of Ibn Khaldun's prolegomena in the British Museum. (MS. No. 9574, fol. 162, *verso*, &c.)

The table begins with two provinces, the names of which we are unable to understand: the revenue derived from them is stated to be 37,780,000, and 14,800,000 dirhems. The other provinces are as follows:—1. Nejrân, 200 striped garments. 2. Sintân, 240 pounds (*rotl*) of terra sigillata. 3. Kesker, 11,600,000 dirhems. 4. Provinces along the Tigris, 20,800,000 dirhems. 5. Holwan, 4,800,000 dirhems. 6. Ahwaz, 25,000 dirhems, and 30,000 pounds (*rotl*) of sugar. 7. Fars, 27,000,000 dirhems, 30,000 bottles ([illegible]) of rose-water, and 20,000 pounds of currants (or [illegible] *zabib al-aswad*). 8. Kerman, 4,200,000 dirhems. 9. Yemen, 500 robes. 10. Sekwân, 400,000 dirhems. 11. Sind and neighbouring provinces, 11,500,000 dirhems, and 150 pounds of aloe-wood. 12. Segestân, 4,600,000 dirhems, 300 variegated robes, and 20,000 pounds of sweetmeats. 13. Khorasan, 28,000,000 dirhems, 2000 bars (*nokar*) of molten silver, 4000 baggage-horses, 1000 slaves, 27,000 robes, and 3000 pounds of balsam (*ihlîlej*, Myrobalanus Chebula ?). 14. Jorjân, 12,000,000 dirhems, and 1000 pieces (*shokkat*) of silk. 15. Kumis, 1,500,000 dirhems, and 1000 bars of silver. 16. Taberistân and Denyawend (?), 6,300,000 dirhems, 600 carpets, 200 garments (*aksiyat*), 500 robes, 300 towels, 300 *jâmât* (?). 17. Rei, 12,000,000 dirhems, and 20,000 pounds of honey. 18. Hamadan, 11,800,000 dirhems, 1000 pounds of preserved fruits, and 12,000 pounds of honey. 19. The country between Basra and Kufa, 10,730,000 dirhems. 20. Mâsindân, Mihrjân, and the district of the mountains, 4,000,000 dirhems. 21. Shehrezûr, 6,000,000 dirhems. 22. Mosul and its territory, 24,000,000 dirhems, and 20,000 pounds of white honey. 23. Aljezirah, and the provinces along the Euphrates pertaining to it, 34,000,000 dirhems. 24. Azerbijan, 4,000,000 dirhems. 25. Kerkh, 300,000 dirhems. 26. Ghilan, 5,000,000 dirhems, 1000 slaves, 12,000 leathern bottles of honey, 10 robes of honour, and 20 garments. 27. Armenia, 13,000,000 dirhems, 20 carpets, 200 mules, 30 robes of honour, and two other articles which we cannot make out. 28. Kinnesrîn, 400,000 dinars, and 1000 loads of currants (or raisins ?). 29. Damascus, 420,000 dinars. 30. The district along the river Jordan, 96,000 dinars. 31. Palestine, 370,000 dinars, and 300 pounds of currants (of raisins ?). 32. Egypt, 1,920,000 dinars. 33. Yemen, 370,000 dinars, besides the go[illegible]'s noticed under No. 9. 34. Hejaz, 300,000 dinars. 35. [illegible]arkâ, 1,000,000 dirhems. 36. Africa, 13,000,000 dirhems.

Of the manner in which the government of the caliphs was organized we can as yet form but a very imperfect idea, since no Arabian historian has left us any connected account of it, and we must glean our information from what we find incidentally mentioned. The caliph is at the same time the supreme pontiff and the temporal sovereign of the empire, and from this twofold capacity Ibn Khaldun deduces the five principal duties incident to the caliphat, viz., prayer, administration of justice, the passing of fetwas (*i. e.* the decision of matters under dispute which are not provided for by existing laws), war against the infidels, and the maintenance of order and security in the interior of the state. The caliph is the *imâm* or first priest of the empire, conformably to the example given by Mohammed, who used to write public prayers before the assembled congregation of his followers. The preachers (*Wâïz, Khâtib, Sheikh*) of the several mosques, who preach every Friday in the name of the caliph, are the delegates of the sovereign in this his pontifical character. As supreme judge of the empire, the several *câdis* are his responsible ministers, and the appointment of the latter is one of his principal duties: Omar is the first caliph of whom we find it mentioned that he appointed three câdis, at Medina, Basra, and Kufa. The passing of fetwas is the office of a separate class of judicial functionaries, the *muftîs*. In his duty of extending the faith of Mohammed by waging war against the infidels, the caliph is assisted by the *emirs*, to whom he intrusts the command over the army and authority to conclude peace with the enemy: with these powers the governorship over conquered provinces is often united. Appointments of this nature can be traced as far back as the time of Mohammed, with whom likewise originated the custom of bestowing a banner (*sanjâk*) upon the person, in token of his office. For the purpose of maintaining order and security in the interior of the empire, the Abbaside caliphs (as well as those of Spain) established a body of guards, called the *shorta*, which was placed under the command of a judicial functionary, and had chiefly to watch over the due execution of the decisions of judges.

The two chief personal prerogatives of the caliphat (and of sovereignty in Mohammedan countries generally) are, the right of the caliph to have his name struck on the coinage of the empire, and to have it mentioned every Friday in the public prayers by the Khâtibs or preachers throughout the country. In the history of Mohammedan Asia we find considerable importance attached to these two inalienable concomitants of sovereignty: they are the tacit expression of the public recognition of a new sovereign on his accession to the throne, as well as the sign of open rebellion on the part of a usurper, if either party has his name proclaimed from the pulpits in the mosques, or inscribed on the coinage of the realm. (Joseph von Hammer, *Die Länderverwaltung unter dem Chalifate*. Berlin, 1835. 8vo.)

CALIPPUS, CALIPPIC PERIOD. Calippus, of Cyzicus, lived about 330 years B.C. He is said to have been a disciple of Plato. He observed at the Hellespont, and is said to have detected the error of the Metonic cycle by means of a lunar eclipse which happened six years before the death of Alexander. Very little more is known of him, and that little not worth stating.

The meaning of the *Calippic period* may be briefly stated as follows. Suppose a perfectly central eclipse of the moon to a spectator at the earth's centre, that is, suppose the centres of the sun and moon, and the junction of the moon's orbit with the ecliptic, or the node, to be all at the same point of the visible heavens. The revolutions of these three points, the sun's centre, the moon's centre, and the moon's node, would then begin, and a whole cycle of eclipses would take place, in a manner depending upon the relative motions of the three, until such time as the same phenomenon, namely the central lunar eclipse, again happened at the same node. After this, the cycle of eclipses would recommence in the same order, because all the circumstances of motion on which eclipses depend are recommencing. Thus if the second-hand of a watch were mounted on the same pivot as the minute and hour hand, [illegible] would all be together at twelve o'clock, and all the possible *phases* (appearances) which their relative positions could present would be completed in twelve hours, and then begin again. Next it is evident that though such a coincidence of sun, moon, and moon's node never take place, the period elapsed between two epochs at which the three are very near to each other will prese[illegible] a succession of eclipses which will nearly be repeated [illegible] with nearly the same circumstances, in the next such [illegible]

The cycle of Meton was composed of 235 lunations, or periods from new moon to new moon, containing a very little more than 255 revolutions from a node to the same node again, about 254 complete sidereal revolutions of the moon, and 6940 days, or a few hours more than 19 years. This may be called a first approximation, and it is still sufficiently exact for finding Easter.

Calippus observed that a more correct period might be formed by taking four times the period of Meton, all but one day, or 27,759 days, or very nearly 76 years. This period contains 940 complete lunations, 1020 nodal revolutions, and 1016 complete sidereal revolutions; all very nearly. The Calippic cycle is therefore four Metonic cycles, all but one day. The analogy with the common and leap year will fix this in the memory. Calippus began to reckon his cycles from the new moon next following the summer solstice of the year B.C. 330, being the commencement of the 3rd year of the 112th Olympiad, A.U.C. 423, Julian period 4384, æra of Nabonassar 418.

CALIXTUS, or KALLISTUS, I., one of the early bishops of Rome, succeeded Zephyrinus A.D. 219, and died in 223. Little is known about him; some say he suffered martyrdom, but this is doubted by others. One of the Roman catacombs, or subterraneous cemeteries, was named after him.

CALIXTUS II., son of William Count of Burgundy, succeeded in the see of Rome Gelasius II. in 1119, and died in 1124.

CALIXTUS III., Alonso Borja, a Spaniard and bishop of Valencia, was made pope after the death of Nicholas V. in 1455. He endeavoured to form a general league of the Christian princes against the Turks, in order to save Constantinople. He died in 1458, and was succeeded by Pius II. Calixtus was maternal uncle to Roderic Lenzoli Borja, whom he made cardinal, and who became afterwards pope Alexander VI.

There was another Calixtus, an antipope, who assumed the title of Calixtus III. in the schism against pope Alexander III in the twelfth century, but afterwards submitted and resigned his claim.

CALLA, a genus of plants belonging to the Arum tribe, the most remarkable species of which, *C. Æthiopica*, is now referred to RICHARDIA.

CALLAN, partly in the barony of Kells and partly in the barony of Shillelogher in the county of Kilkenny in Ireland, a decayed borough 80 English miles S.S.E. from Dublin and 8 miles from Kilkenny city. Callan formerly returned a member to the Irish parliament, and at the time of the union George Lord Callan received 15,000*l.* compensation for the loss of the borough. The corporation consists of a sovereign, freemen, and burgesses, whose chief revenues arise from some very obnoxious tolls on all provisions entering the town. A town court is held here every Monday, with jurisdiction to the amount of 40*s.*; but there is neither gaol nor bridewell, nor any charitable institution, with the exception of a free-school under the superintendence of a committee. The population are principally Roman Catholic, and in the parish, town, and liberties amount to 6111, making 1205 families, of whom 580 are chiefly employed in agriculture, 349 in trade or handicraft, and 246 not included in either class, but chiefly paupers. The streets are unpaved, and the mail-coach is allowed twelve minutes extra in passing through. There is no inn in the town, and the state of poverty in which many hundreds of the inhabitants exist is truly frightful. On a mountain near the town is a stone bearing an inscription in Ogham characters which has been the subject of much dispute among Irish antiquarians. Callan is the property of Lord Clifden. (*Reports of Commissions on Municipal Corporations in Ireland*; Inglis's *Ireland in* 1834.)

CALLA'O, on the coast of Peru, in South [illegible]ica, is the sea-port of Lima, from which it is 7 miles dist[illegible] by a go[illegible] level road skirted on each side by trees. The bay is formed by the isles of San Lorenzo and Fronton, and a low sandy point projecting from the main, between which however there is a safe passage half a mile wide, called the Vessels are well sheltered from all winds, except betwe the north and west, which seldom blow with violence. Callao is the safest and most convenient port, not only in Peru, but as far along the coast as Conception, in Chili. The sea is always tranquil, and there is anchorage every where in the bay from 7 to 10 fathoms, without any danger. A shoal extends about 400 yards from the beach, except immediately opposite the town, where a mole has been formed by sinking old hulks, within which vessels of large burden may lie and discharge their cargoes. During the war of independence they were secured by a boom across, and it was from this situation that Lord Cochrane so gallantly cut out the Esmeralda Spanish frigate. There is always a heavy surf on the beach, and to the southward of Callao point landing is seldom practicable, but within the mole boats may always land with safety and ease. Ships may obtain water from a small rivulet which runs through Callao and discharges itself within the mole, but the water is not good; it turns black, and has an unpleasant taste. Supplies of all sorts may be had in abundance,—meat, live stock, vegetables, and fruit, cocoa, sugar, and spirits; but wood is very scarce.

The increasing commerce of Lima causes a corresponding influx of vessels from Europe into Callao bay, besides which there is great traffic with the other states of western America.

The town was originally built in the reign of Philip IV., and stood farther out on the point than its present site. In 1746 it was entirely destroyed by an earthquake, which demolished three-fourths of Lima itself; of the inhabitants about 4000 perished, and 19 vessels were lost, some of which were thrown to a considerable distance inland. Vestiges of the old town may still be seen on the point, buried in sand. Callao has been rebuilt on the same plan as before, but farther removed from the sea, and on a much firmer soil. The houses are flat-roofed and slightly constructed of cane wicker-work, plastered with mud, on account of the frequency of earthquakes, which take less effect on such frail edifices. The rare occurrence of rain in Peru, and its generally mild climate, render substantial dwellings unnecessary. Very heavy dews at night supply the want of fertilizing showers.

Callao itself consists almost entirely of the forts, barracks, custom-house, and other government buildings; the other houses, or rather huts, being chiefly pulperias (a low wine and chandler's shop): but the village of Bellavista, distant about three-quarters of a mile, offers more convenience for residence. The fortifications of Callao consist of two round castles connected by a curtain, and another on the point stretching towards San Lorenzo, all commanding the bay, towards which they present a battery of above sixty pieces of cannon, chiefly of large calibre. The principal fort was called San Philip, but is now named La Independencia; beneath its walls is the arsenal. Their great strength enabled the Spaniards to hold out long after Lima had fallen into the hands of the patriots, to whom however they ultimately surrendered in September, 1821, their supplies being cut off both by land and sea. Their fall may be said to have determined the independence of Peru.

A mile to the northward of Callao is the river Rimac, which passes through Lima, and six miles farther is another river called Carabaillo. Both of these streams run through a tract of very fine sand; they are not navigable even for boats.

The tides in Callao bay are very uncertain and irregular, being greatly influenced by the strength and direction of the wind. San Philip castle is in 12° 4′ S. lat., 77° 4′ W. long. (Various *Voyages* in the Pacific.)

CALLEI′DA, a genus of coleopterous insects of the section *Truncatipennes* and family *Brachinidæ*.

This group was separated from the genus Tarus of authors, by Dejean, and is chiefly distinguished by the species having the penultimate joint of the tarsi bilobed.

Upwards of twenty species of this genus are enumerated in Dejean's catalogue, most of which are of brilliant metallic colouring, and inhabit the hottest climates, in both of which respects they likewise differ from the typical species of Tarus.

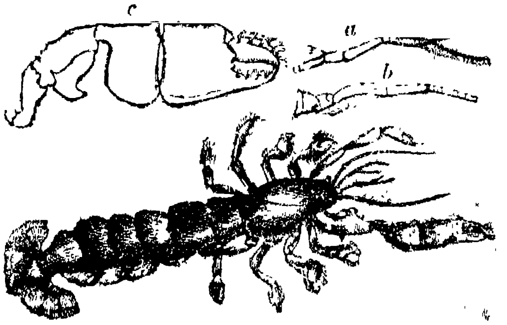
CAL—DER. [PERTHSHIRE.]

CALLET, JEAN-FRANÇOIS, born at Versailles, October 25, 1744. His mother was stated by a family tradition to have been of the family of Des Cartes. He came to Paris in 1768; in 1783 he published his edition of Gardiner's ______ms in octavo. In 1788 he was made fessor of hydrography at Vannes, and afterwards at Dunkirk. He returned to Paris in 1792, and was *professeur des ingénieurs ______ au Dépôt de la Guerre* for four years. After the suppression of this place, he became a private teacher of mathematics. In 1795 he published his stereotyped logarithms, with tables of logarithmic sines for the new decimal division of the circle, the first which had then appeared. He died November 14, 1798.

The preceding dates and facts are from Lalande, *Bibliog. Astron.*, p. 805. The short account there given has been furnished verbatim by an anonymous writer to the *Biog. Univ.*, without acknowledgment.

The last logarithms of Callet ('Tables portatives de Logarithmes,' Paris, Firmin Didot, 1795) are still in general use, and are very convenient in many respects. The logarithms of numbers are arranged so that when the third figure changes, the line in which the remaining four figures are placed falls, so that the latter are opposite to their correct proceding figures. The logarithmic sines, &c., are to every ten seconds, sexagesimal as usual, the first five degrees being to every second.

CALLIANASSA (Leach), a genus of macrourous decapod crustaceans, the chelæ of which are very unequal both in form and in their proportions. The carpus of the largest chela is transversal, and forms a common body with the claw; the same joint of the other chela is elongated. The two posterior feet are nearly didactylous. The external foliation of the lateral fins of the end of the tail is larger than the internal. The carapace is slightly elongated, smooth, and terminated suddenly by a small beak. The abdomen is of considerable size, and nearly membranous. The other general characters are those of *Thalassina* [THALASSINA]. The only species known is *Callianassa subterranea*, which is found on the sands of the sea-shore washed by the tides, on the French and English coasts.



[Callianassa subterranea.]

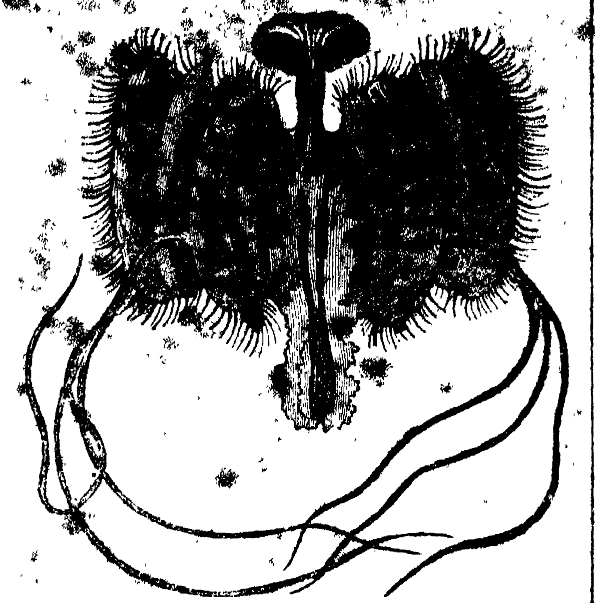
a, Intermediate antenna. *b*, External antenna. *c*, Right chela.

CALLIANIRA, or CALLIANYRA (Zoology), a genus of *Ciliograda*? established on no very sure foundations, by Péron and Lesueur, in their Memoir on the Pteropoda, and considered by them to belong to the type of the *Malacozoaria*, without sufficient evidence. Not that there is any very satisfactory proof of the actual state of its particular organization, though there is sufficient information to warrant the conclusion that in its general character it is not far removed from Beröe [BERÖE]. Lamarck, who perceived this relation, states that it was first established by Péron, in manuscript, under the name of Sophia; and the species described by him had, according to his account, a membranous gelatinous wing, divided into two large folioles provided with cilia on their margins.

De Blainville, who observes that callianira is only known by figures and descriptions not very complete in their details, states that Slabber's figure, copied by Bruguieres, was drawn after an animal from the coasts of Holland, and that the description was taken from another belonging to the waters of Madagascar; information which De Blainville acknowledges that he owes to Professor Vanderhoeven. De Blainville adds that M. Eschscholtz refers them to two different species.

The following is the generic character given by De Blainville:—Body regular, gelatinous, hyaline, cylindrical, elongated, tubular, obtuse at the two extremities, and provided with two pair of wing-shaped appendages, which develop themselves in large foliations, and are fringed with a double row of vibratory cilia upon their edges. A pair of tentaculiform appendages, branched, and [illegible]. A large transverse opening at one of the extremities, and probably another smaller one at the other.

Example,—*Callianira triploptera.*



[Callianura triploptera.]

CALLI'CERA (Meigen), a genus of insects of the order diptera and family *Syrphidæ*, section *Athericera.* This genus is allied to Ceria of Fabricius, and differs principally in having the body shorter and wider in proportion, and silky. The second joint of the antennæ is shorter than the last, and forms with it an elongated, compressed, slightly-curved club.

CALLICHRO'MA, a genus of coleopterous insects of the section *Longicornes* and family *Cerambycidæ*, distinguished from the allied genera (*Cerambyx Phœnicocerus*, &c.) by having the maxillary palpi smaller than the labial, and shorter than the terminal lobe of the maxillæ. The posterior tibiæ are generally much compressed.

As in the genus cerambyx, the species of this genus emit a very agreeable odour.

CALLI'CHTHYS (Linnæus), a genus of fishes belonging to the section *Abdominal Malacopterygians* and family *Siluridæ*; distinguished by the species having the body almost entirely protected by four ranges of large, hard, scaly plates: the head is also protected with plates of the same texture: the snout and under surface of the body are the only naked parts. The mouth is not deeply cleft, and is furnished with four long cirri, two from each corner; the teeth are very small: eyes small, and situated on the side of the head.

The species of this genus generally frequent rivers and streams. Like eels, they can live for a considerable time out of water, and as they are natives of hot climates, the streams which they inhabit not unfrequently dry up: when such is the case they are said to perform long journeys over land, directing their course to some other stream. In some instances they bury themselves in the mud.

If we consider their structure, it certainly appears well adapted to such migrations, their large strong and bony pectoral fin ray being used as a propeller, and the large hard scales, which are serrated at the edges, would not only serve as a protection, but, from their disposition, would also help in propelling them through the herbage.

The genus *Callichthys* appears to be included in the genus *Cataphractus* of Willoughby and Ray and some others among the older authors.

CALLI'CRATES. [PARTHENON.]

CALLICRA'TIDAS, a Spartan officer who was appointed to succeed Lysander in the command of the Peloponnesian fleet in the Ægean sea, B.C. 406, at the beginning of the 24th year of the Peloponnesian war. Of simple, straightforward character, he was no match for Lysander and his friends in the arts of intrigue; and they used their best endeavours to perplex his plans, and frustrate all his opera-

So far as the caballing of his officers was concerned, he got over the difficulty by putting the simple question—whether they preferred that he should retain the command, or that he should sail home, and relate at Sparta the condition in which he found things: for none durst stand the chance of accusation at home. But, for the pay of his fleet, he was dependent upon Cyrus [CYRUS], the Persian commander-in-chief of the king's forces in western Asia Minor; and when he went to that prince at Sardis to obtain a supply of money, he was so disgusted by Asiatic pride, and ceremony, and dilatoriness, that, leaving the object of his journey unaccomplished, he returned to Miletus, saying that the Greeks were indeed miserable thus to cringe to barbarians for their money, and that if he lived to return home he would do his best to reconcile the Athenians and the Laceda

Having obtained a sum upon loan, he sailed to

took Methymne by assault. The town was given up to

lage. Callicratidas was urged to sell the citizens for slaves, according to the usual practice of Greek warfare; but he replied, that while he had the command no Grecian citizen should be made a slave. This liberal sentiment however did not influence him in regard to the Athenians; for Xenophon (if there is no error in the text) says in the next line that the Athenians who formed the garrison were sold. (See the Note of F. A. Wolff on this passage.)

After this success Callicratidas met Conon, the Athenian commander, at sea; attacked him; gained a victory, and blockaded him in the harbour of Mytilene. Intelligence of this arriving at Athens, a powerful fleet of 110 ships was equipped and manned within the space of 30 days, and sent to the relief of Conon. Callicratidas left 50 ships to maintain the blockade, and with only 120 advanced to meet the enemy, whose number was increased by reinforcements from the allied states to 150 and upwards. The fleets met between Lesbos and the main land, near the small islands called Arginusæ. Hermon, the master of Callicratidas's ship, recommended the Spartan commander to retreat without hazarding a battle. He replied, that if he were dead Sparta would be no worse off; but that it was base to fly. The battle was long and doubtful, but ended in the complete defeat of the Lacedæmonians, with the loss of 70 ships. Callicratidas perished in it, being thrown overboard by the shock of his own ship against one of the enemy. (Xen. *Hellenics*, lib. i. c. 6.)

CALLI'DIUM, a genus of coleopterous insects of the section *Longicornes* and family *Cerambycidæ*. Technical characters: body depressed, thorax wider than the head, rounded at the sides: antennæ generally shorter than the body: palpi rather short; the terminal joint thicker than the rest, and truncated at the apex. Legs short; femora suddenly thickened towards the apex, especially in the males; tibiæ simple.

Callidium Bajulus is not an uncommon insect in this country: it lives during the larva state in fir timber, and when it occurs plentifully is exceedingly destructive. Th perfect insect is about three-quarters of an inch flattened elongate form, and dull black or pitch colour; the thorax is pubescent and has two smooth glossy tubercles on the disc; the elytra are furnished with a fascia (more or less distinct) of silvery white hairs.

Instances have been recorded of these insect the fir rafters of houses, to which they are of course ingly injurious, and we have known instances when fect insects, in order to effect their escape, have perfo the lead with which the house-top was covered.

In many of the deal palings in the neighbourhood of don, and elsewhere, numerous oval-shaped holes (about a quarter of an inch in diameter) may be observed; these are formed by the perfect insect of this species of callidium to effect their escape, having passed through the larva and pupa states within the wood.

Mr. Stephens, in his 'Catalogue of British Insects,' enumerates thirteen species of this genus, but of these many have undoubtedly been imported in foreign timber.

CALLI'MACHUS, a Greek poet, was at the height of his reputation a little after the time of the first Punic war, 264 B.C. (Aul. Gell., xvii. 21, 41.) We learn from Suidas the following particulars respecting him. He was the son of Battus and Mesatma, was born at Cyrene, and studied under Hermocrates of Iasus. His wife was the daughter of one Euphrates, a Syracusan; he had a sister called Megatima, who married one Stasenor; the offspring of this marriage was a son, who bore the same name as his [illegible], and wrote an epic poem on islands (περὶ νήσων). Callimachus, before he was taken into favour by Ptolemy Philadelphus, by whom he was highly honoured (Strabo, p. 838), kept a school in a quarter (κωμύδριον) of Alexandria called Eleusis, and had [illegible] pupils Eratosthenes, Aristophanes of Byzantium, the celebrated grammarian, and Apollonius of Rhodes, the author of the *Argonautics*. He was alive when Ptolemy Euergetes ascended the throne, B.C. 247. This is the statement of Suidas (v. Καλλίμαχος). It appears from an epigram attributed to him (Jacobs, *Anthol. Palat.*, vol. i. p. 466) that his grandfather's name was also Callimachus; and the assertion of Suidas, that he was the son of Battus, is perhaps merely an inference from his epithet Battiades, which may be explained from the fact that he believed himself descended from the founder of Cyrene (Strabo, p. 837). Of his numerous writings only some hymns and epigrams remain. Of his lost works, which are most quoted, we may mention his 'Hecale,' a long poem (on which we refer our readers to the learned papers by Näke in the *Rheinisches Museum*, ii. 4, and iii. 4); his historical Memorials, which are also attributed to Zenodotus (Athen. iii. p. 95); a 'Treatise on Birds,' also quoted by Athenæus; and a 'List of all kinds of Writings' (*πίναξ παντοδαπῶν συγγραμμάτων*), which consisted of 120 books; so that he doubtless merited the epithet 'well-informed' (*πολυΐστωρ*), given him by Strabo (p. 438). He wrote an invective under the name of 'Ibis' against his scholar Apollonius, who had offended him, and the title was subsequently adopted by Ovid for a satirical poem of the same kind. [Berenice.] As we might expect from the age and employments of Callimachus, his remaining poems display much more of grammatical art than of poetical imagination, although they are not without that kind of beauty which is the result of much labour and learning. The first edition of the Hymns of Callimachus was by John Lascaris, Florence, 4to., probably printed about A.D. 1500: this edition is printed in capital letters. The latest editions are that by Blomfield, 8vo., Lond., 1815; and a small edition by Volger, Leipzig, 1817, 8vo.

CALLIMO'RPHA (Latreille), a genus of insects of the order *Lepidoptera*, section *Nocturna*, and family *Lithosiidæ* (Stephens). Technical characters:—antennæ slightly ciliated in the males; palpi small, three-jointed; legs moderate, the hinder tibiæ each with two pairs of spurs; body slender, especially in the males; wings large, somewhat triangular, with the hinder margins rounded.

Callimorpha Jacobææ (the pink underwing), is a very beautiful and common moth: when the wings are expanded it measures about an inch and a half in width; the upper wings are of a greenish-black colour, with two round pink spots at the apex, and an oblong dash of the same colour extending nearly the whole length of, and parallel to, the outer margin. The underwings are entirely pink with the exception of the margins, which are of the same tint as the ground colour of the upper wings. The head, thorax, abdomen, and legs are entirely black.

The caterpillar of this moth is not uncommon in the neighbourhood of London, but in some situations it is found in the greatest abundance in the month of June, feeding upon the flowers of the ragwort, and often upon groundsel. It is of a bright yellow colour, with numerous slender black bands, and is sparingly covered with hair. The moth appears in the month of May.

CALLINGTON. [Cornwall.]

CA'LLIODON, a genus of fishes of the section *Acanthopterygii* and family *Labroides*. This genus was separated from that of Scarus (Linn.) by Cuvier, and differs in the species having the lateral teeth of the upper jaw divided and pointed; the upper jaw is also furnished with an inner range of small teeth. Scarus spinidens of Quoy and Gaimard is given as an example of this genus. [Scarus.]

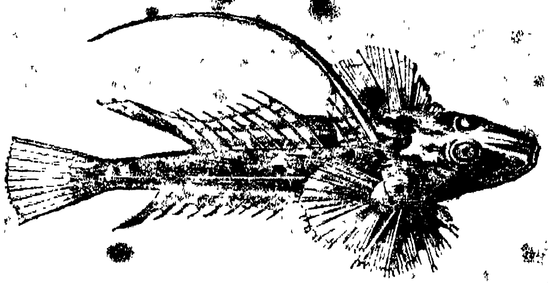
CALLIO'NYMUS, a genus of fishes of the section *Acanthopterygii* and family *Gobioidæ*.

The species of this genus are known in England by the name of Dragonets. Their branchiæ have but a single small opening placed near the nape of the neck; their ventral fins are widely separated, larger than the pectorals, and situated under the throat: the head is oblong and depressed; the eyes are placed on the top of the head and rather close together: body smooth and without scales; intermaxillaries very protractile; teeth small, numerous, and [illegible] the anterior dorsal fin has the first [illegible] elongated.

Two species of this curious genus (remarkable for the peculiarities in the [illegible] and ventral fins, above noticed) are found on our own coasts; of these, the sordid Dragonet (*C. Dracunculus*) is the better known, being frequently met with at the mouth [illegible] It is about ten inches long and of a reddish-brown colour [illegible] ge; the under parts, the head, pectoral and ventral fins [illegible] ordinarily white; the dorsal fins are of an immaculate pale brown.

The Gemmeous Dragonet [illegible] (the other British species) very closely resembles [illegible] above described, and indeed has by [illegible] been considered as the same species. There appears however to be very [illegible] for separating them, independent of the di[illegible]e of colour. The prevailing hue of this species is yellow of various shades, with sapphirine stripes and spots on the head and sides of the body. The ventrals and caudal fins are bluish-black.*

This species has been found on various parts of our own coast, as well as that o[illegible] an[illegible] It [illegible] occurs in the Mediterranean and on the coast of Norway.



[Gemmeous Dragonet.]

The Dragonets live at the bottom of the water, as might be supposed from the disposition of the eye. Their food consists of small shell-fish and worms. They are sometimes caught by the shrimpers whilst fishing.

CA'LLIOPE. [Muses.]

CALLI'RHÖE (Zoology), a genus which, in the opinion of De Blainville, was ill characterized by Peron and Lesueur, and he adds that it would not be surprising if it should turn out not to differ from Aurelia. Eschscholtz places it under his fourth family, *Oceanidæ*, of the *Cryptocarpæ*, which forms the second section of his *Discophoræ*. Generic character:—Body circular, diversiform, furnished with cilia or tentaculiform cirrhi at the circumference, very much excavated below, with one orifice in the midst of four long and triangular appendages: ovaries four in number. Of the two species recorded, one, *Calirrhöe Basteriana*, inhabits the German Ocean; the other, *Cal. micromema*, was found in the South Seas.

CALLI'STHENES. [Alexander.]

CALLI'STUS (*Bonelli*), a genus of coleopterous insects of the family Harpalidæ (Mac Leay). Technical characters: three basal joints of the anterior tarsi dilated in the males. Palpi with the terminal joint elongated, rather ovate, and terminated almost in a point. Antennæ filiform and slightly compressed. Labrum transverse, emarginated anteriorly. Head somewhat triangular. Thorax nearly heart-shaped. Body rather short and depressed.

Only one species of this genus has hitherto been discovered, but it is found almost all over Europe: it is not uncommon in France, and is found beneath stones. In England it is rather scarce.

This species (*Callistus lunatus*) is conspicuous in the cabinets of British insects from its beauty. It is about one-quarter of an inch long, the head and under parts of the abdomen are of a greenish black colour; the thorax is reddish yellow, and the wing-cases are yellow with six black spots, placed, two at the base, one on the disc of each elytron which extends to the outer margin, and two at the apex: these spots are large, and occupy about one-half of the whole surface of the elytra. The antennæ are black, with the two basal joints yellow. The legs are black, with the base of the femora and tibiæ yellow. The head and thorax are very thickly punctured; the elytra are punctate-striated. The upper parts, with the exception of the head, are devoid of glossiness.

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* In the *Sordid Dragonet* the head bears the proportion of one to five of the whole length of the fish, and is of the form of an equilateral triangle: the distance between the eyes and the nostrils is only equal to one diameter of the former.

In the *Gemmeous Dragonet* the head is of an oblong-ovate form, and its length, compared with that of the fish, is as one to four: this species may also be distinguished from the former by its less depressed form.

CALLITRICHA'CEÆ, a small natural order of Achlamydeous dicotyledonous plants, consisting of a few obscure floating species, all of which belong to the genus Callitriche. The distinctive character resides in the presence of several one-seeded carpels, combined into a single pistil with two styles, and altogether destitute of any floral covering. Brown, and many others, consider the order related to Halorageæ; but Lindley places it near Podostemaceæ, and looks upon its affinity to other dicotyledons as being of the same nature as that borne by Lemna to Monocotyledons. (*Natural System of Botany*, second edition, p. 191.)

CALLOT, JACQUES, an eminent engraver, was born at Nanci, of a family recently ennobled, in the year 1593. His father discountenancing his choice of a profession, he fled from home in order to make his way to Rome, the capital of the fine arts. Falling in with a troop of gipsies, he travelled in their company as far as Florence, where a gentleman, pleased with his ingenuous ardour, placed him with an artist to study; but he soon left him for Rome. At Rome he met some acquaintances of his family, who compelled him to return home. He ran away a second time, and was a second time brought back, by his elder brother, whom he met at Turin. During his youthful adventures, as the story goes, his morals were preserved uncorrupted, by his constant prayer that he might grow up a good man, excel in his profession, and live to the age of forty-three. He set out a third time, with his father's tardy concurrence, and studied for a long time at Rome. On his way homewards he was detained for many years by Cosmo II. After the death of his patron he returned to Nanci, married, and fixed his residence among his friends. He acquired considerable wealth, and his fame was such that he was invited to witness and perpetuate the events of the siege of Breda, and afterwards the sieges of Rochelle and Rhé; but he declined to commemorate the subsequent capture of his native place, and likewise refused a pension and lodging at Paris, offered to him by Louis XIII. He died March 28, 1635, of complaints incidental to the practice of his art.

His invention is lively and fertile, and he had a singular power of enriching a small space with a multitude of figures and actions. He engraved both with the burin and the needle; but his best works are free etchings, touched with the burin, delicately executed, and sometimes wonderfully minute. There is a want of unity and breadth of effect in some of his larger engravings, which is not surprising in one who did not practice painting, and engraved even fewer pictures than most of his profession, working chiefly from original designs. His principal works are the 'Sieges,' above-mentioned, the 'Miseries of War,' certain 'Festivities at Florence,' and a set of 'Capricci.' (Felibien; Perrault.)

CALMAR, or **KALMAR**, a town in Sweden (about 56° 40′ N. lat., and 16° 20′ E. long.), in that portion of the antient province of Smaland which now forms the political division of Calmar Lan. The town itself is on an island called Quarnholm, in the straits, which divide the island of Oeland from the mainland, and are called the Straits of Calmar. It is united by a bridge to the suburb, which is on the continent. The suburb contains the old castle, in which the union of Calmar was agreed to in 1397, by which the three northern kingdoms were united under one sovereign. In one of its chambers the magnificent bed of Queen Margaret is still shown. The town is regularly built, but few of the houses are of stone, though there are excellent stone-quarries in the neighbouring island of Oeland. The most remarkable building is the cathedral, which stands in the middle of the great square. Calmar has a good grammar-school, and another for the lower classes, and also institutions for the instruction of poor children. The harbour is good, and the commerce of the town active, though less so than formerly. It exports the produce of the country—iron, alum, pitch, tar, boards, &c., and a great quantity of stone from the quarries of Oeland. Many vessels are built here; and the ships belonging to the town amounted in 1814 to seventy-five. There are four manufactories of snuff, and one of potash. The population is about 5000. (Schubert's *Reise durch Schweden.*)

CALMET, AUGUSTINE, was born at Mesnil-la-Horgne, near Commercy, in the modern department of the Meuse, on Feb. 6th, 1672, and received the first rudiments of his education at the priory of Breuil; he studied rhetoric afterwards at Pont-à-Musson. He afterwards entered among the Benedictines in the abbey of St. Mansuy, in the Fauxbourg of Toul, where he professed their vows in 1689. Greek, Hebrew, philosophy, and divinity engrossed his time until 1704, when he was appointed sub-prior at the abbey of Munster, in which he appears to have diligently pursued his biblical studies. In 1707 he published in French the first volume of his commentaries upon the Bible. In 1715 he purchased the priory of St. Lay from the Abbé Morel, the king's almoner, for a pension of 3000 livres, and three years afterwards he was appointed abbé of St. Leopold of Nanci. His priory of St. Lay was surrendered by him when, in 1723, he was chosen abbé of Senones, and he then also declined the title of bishop *in partibus infidelium*, which was offered to him by Pope Benedict XIII., at the suggestion of the college of cardinals. He died in his abbey on the 25th of October, 1757, greatly esteemed both for learning and for moderation. The following is a list of his principal works:—

'Commentaire Littéral sur tous les livres de l'Ancien et du Nouveau Testament,' 1707—1716. In 23 vols. 4to. Reprinted in Paris 1713, 26 vols. 4to. and 9 vols. fol.; and abridged in 14 vols. 4to. Rondet published a new edition of this abridgment, Avignon, 1767, 1773, 17 vols. 4to. The Dissertations and Prefaces belonging to his Commentary were published with 19 new Dissertations, Paris, 1720, 2 vols. 4to. 'Histoire de l'Ancien et du Nouveau Testament,' intended as an introduction to Fleury's Ecclesiastical History, 2 and 4 vols. 4to., and 5 and 7 vols. 12mo. 'De la Poesie et Musique des Anciens Hebreux.' Amst. 1725, 8vo. 'Dictionnaire Historique, Critique, et Chronologique de la Bible, enrichi d'un grand nombre de figures en taille douce qui representent les antiquités Judaiques.' 'Dictionnaire de la Bible,' &c., 2 vols. 4to., Paris, 1722. 'Supplement a ce Dictionnaire,' 2 vols. 4to., Paris, 1728. Reprinted in 4 vols., 4to., Paris, 1730. This most valuable work was translated into English, under the title 'Historical, Geographical, Critical, Chronological, and Etymological Dictionary of the Holy Bible.' To which is added 'Bibliotheca Sacra,' or a catalogue of the best editions of the Bible, and commentaries upon it translated by J. D. Oyley and J. Calson, with cuts. London, 1732, 3 vols. folio. A new edition, to which the following work has been added, 'Fragments illustrative of the Manners, Incidents, and Phraseology of the Holy Scriptures, intended as a continued Appendix to Calmet's Dictionary of the Holy Bible,' was published Lond. 1798, 1800, 2 vols. 4to. 'Histoire ecclesiastique et civile de la Lorraine depuis l'entrée de Jules Cesar dans les Gaules jusqu'à la mort de Charles V. Duc de Lorraine; avec les pieces justificatives à la fin.' Nancy, 1728, 4 vols. fol. Reprinted 1745 in 5 vols. fol. 'Bibliothèque des Ecrivains de Lorraine,' 1751, folio. 'Histoire Universelle Sacrée et Profane,' 15 vols. 4to. This undertaking Calmet did not live to finish, and, in other respects, it is not his best work. 'Dissertations sur les Apparitions des Anges, des Démons, et des Esprits, et sur les Revenans et Vampires de Hongrie,' Paris, 1746, 12mo. Einsiedlen, 1749, 12mo. Paris, 1751, 2 vols. 12mo. Translated and published in English in 1759. 8vo. 'Commentaire Littéral, Historique, et Moral, sur la Règle de St. Benoît,' 1754, 2 vols. 4to. Perhaps the most useful of Calmet's works, certainly the one most familiar to the English reader is the 'Dictionary of the Bible.' All his works indeed are replete with learning, but should be read with some degree of caution. Calmet was deeply imbued with fanciful and rabbinical theories. Though a man of great learning he had a strong leaning to the marvellous, and his tendency to superstition was not controlled by a sound judgment. Voltaire, in his usual lively manner, describes him as a man who does not think, but furnishes others with materials for thinking.

CALMS (at sea) occur at certain seasons in every part of the ocean, except perhaps the parts near the poles; but they seem to increase in frequency and duration as we approach the equator, and in the immediate vicinity of the equator there is an immense extent of sea, in which they are so prevalent that it has been called the *region of calms*. The calms, however, do not always occupy the same portion of the ocean, but they vary according to the position of the sun. When the sun is in the northern hemisphere, they are sometimes found to extend as far as 15° N. lat., and then the S.E. trade-wind passes four or five or even six degrees to the N. of the equator. When the sun is in the southern hemisphere, the calms also occur to the N. of the equator, but they come very near to it and sometimes reach it, whilst their northern border extends to 60° or 70° N. lat. Thus it appears that the region of calms does not extend on both sides of the equator, but is entirely in the N. hemisphere. In some seasons the calms extend over eight or even nine degrees of latitude; at others over a smaller space, and sometimes only over two and a half or three degrees. The average breadth of the region of calms may be between five and five and a half degrees. These remarks, however, refer only to the Atlantic Ocean, and for want of observations we are unable to decide whether or not they apply to the Pacific also.

In the region of calms which separates the N.E. and S.E. trade-winds the calms do not continue without interruption. Sometimes light breezes blow, especially from the S. and S.S.W. Besides this the calms are commonly interrupted every day by a wind which lasts a quarter of an hour or twenty minutes. After noon a black and well-defined cloud is formed near the E. horizon, which seems to announce a violent thunderstorm. The cloud increases, a wind suddenly rises, and blows with great violence for a few minutes. It is accompanied by a few drops of rain, but in a few minutes the rain ceases, the air reassumes its clearness, and the calm returns. These daily squalls, though of short duration, enable the navigator to pass the region of calms, which even with this aid always proves very disagreeable. These calms, united to the immense quantity of fucus or gulf-weeds which is found W. of the Cape Verde Islands, may have given rise to the opinion of the antients that the sea near the equator grows shallow, and becomes a swamp unsuited for navigation. (Horsburgh, *India Directory*; Rennell's *Invest.*; and Humboldt.)

CALMUCKS, or CALMACKS, is the name given by the Russians to one of the principal branches of that division of the Mongols which bears the general name of Olöth, or Oirat. This nation is more widely dispersed over the globe than any other, even the Arabs not excepted. Calmuck tribes occur over all the countries of Upper Asia between 38° and 52° N. lat., and from the most northern bend of the Hoang-ho to the banks of the Volga. We are acquainted with four principal branches. The Oloth inhabited chiefly the centre of these countries, to the S. and N. of the Thian-Shan range, in the present Chinese government of Ili, whence they extended their conquests over the neighbouring tribes during the seventeenth century, and founded an empire of great extent and power, which was destroyed by the Chinese emperor Kang-hi in 1698. Upon this event the name of Olöth merged in that of Zoongars, another numerous nation of the same origin, which inhabited the adjacent countries. The Zoongars also were for a short time formidable to the neighbouring tribes, especially the Khalkas, or proper Mongols: their empire was destroyed by the Chinese in 1757. By these continual and unsuccessful wars both nations have nearly been annihilated, and their names have nearly disappeared. The Torbod or Turbut, forming the third principal branch, had long before these events submitted to the Chinese emperors: and they still inhabit the countries about the lake of Koo-koo-nor, and along the Hoang-ho river, where it forms its great northern bend. They are considered and treated by the Chinese rather as allies than as subjects.

The fourth branch of the Olöth, which received the name of Calmucks from the Russians, is properly called Toorgoot, and inhabited the countries W. of those of the proper Olöth. But during the continual wars which they had to wage with these more powerful neighbours, they began to extend their excursions towards the W., and at last settled, with the permission of the Russians, in the steppes which extend between the Volga and the Ural, in 1672. There they remained nearly a century. But in 1771, after having repeatedly been invited by the Chinese to return to their native country, the greatest part of them suddenly left the Russian territories, and returned, by a march of eight months, to the banks of the river Ili, where the countries whose inhabitants had been destroyed in the wars between the Chinese and Zoongars were assigned to them by the Chinese. Their number was estimated at 50,000 families, or 300,000 souls. The smaller portion of the nation remained in Russia. In the following year the remainder, as well as a small number of families belonging to the Olöth Proper, who had taken refuge in Russia at the time of the destruction of their empire, also returned to the Ili. The number was about 30,000 families, or 180,000 souls, who were settled in the same country, between the Ili and the upper branches of the Irtish. The number of families that remained in Russia was estimated by Pallas, in 1793, at 8229.

In the form of their body the Calmucks do not differ from the Mongols, and the languages of the two nations perhaps not more than the Italian and the Spanish; but the proper Mongols have a rich literature, while that of the Calmucks seems to be limited to a few compositions or translations respecting the tenets of Bhuddism, a religion which has been embraced by all the nations of Mongol origin.

The Calmucks have no fixed abodes, but moveable huts, called kybitkas, which they carry from one place to another, in order to be always near the best pasture for their herds. They live entirely upon animal food, and do not cultivate the ground. They have large numbers of camels, horses, and sheep, but not many cattle. Their horses are of a middling size, very strong and swift. Their sheep are of the same kind as those of the Kirgis, with large tails and good wool, of which the women make different stuffs for dresses, blankets, coverings for the kybitkas, &c.

They are not the immediate subjects of the princes in whose countries they live, but have their own hereditary chiefs, and an hereditary nobility, to whom they are much attached, and to whom they pay strict obedience. Their military or marauding excursions, to which they are much inclined, owing to their wandering habits of life, make them very troublesome to their neighbours. (Pallas; Ritter's *Asien*.)

CALNE, a parish, borough, and market-town in Wilts, in the hundred of Calne, 87 miles W. from London, on the Bristol road. It derives its name from being situated on a river called the Calne or Marden, which, after passing through the town, falls into the Avon. The parish contains about 8000 acres, and the population in 1831 amounted to 4795. The new parliamentary borough includes the parish and also those portions of other parishes which are surrounded by the parish of Calne. It returns one member to parliament; before the passing of the Reform Act it had returned two members from the 23rd of Edward I., with a few occasional interruptions. The municipal borough at present extends no farther than the old parliamentary borough did, not including the whole of the town.

This place is of remote antiquity; many Roman remains have been found in the neighbourhood, particularly in the hamlet of Studley, which was a Roman station. The West Saxon kings had a palace at Calne, and an hospital of black canons existed here. In 977 a synod was held here for adjusting the differences between the monks and the secular clergy, at which the celebrated Dunstan presided: the floor of the room gave way, and the whole assembly fell with it except Dunstan, whose preservation was attributed to the miraculous interposition of Providence on the behalf of the cause which he advocated. Calne is described in Domesday Book as 'Terra Regis,' and is called 'Cauna.'

The church is a large, lofty, and handsome edifice, well pewed, and lighted in a very superior manner with gas: it exhibits many different orders of architecture, having been built at various times. The tower, which stands at the N. side of the church, and contains a peal of eight deep-toned bells, is remarkable for the beauty of its proportions: it was built by Inigo Jones after 1628, in which year the tower and spire standing on the transept of the church fell. The living, which is a vicarage, with the chapelries of Cherhill and Berwick Bassett annexed, is in the presentation of the treasurer of the cathedral church of Sarum, and is in the peculiar jurisdiction of the dean of Sarum; it was one of the churches first given up by Bishop Oswald to the above cathedral on its foundation in the reign of William Rufus, and is rated in the king's books at 8*l.* 5*s.* The present average net income, according to the *Ecclesiastical Revenues' Report*, is 769*l.* The Marquis of Lansdowne is the lay impropriator. There are places of worship for various denominations of dissenters.

The town has lately been much improved, particularly by the introduction of gas, with which the streets are well lighted: the houses are substantially built with stone, which is found here in abundance. The public buildings, besides the church, are the town-hall, which was repaired a few years since by the Marquis of Lansdowne, and given by him to the corporation; and the boys' school, a commodious and ornamental Gothic building, erected by subscription in 1829. The public schools are the grammar-school, founded in 1660 by John Bentley, Esq., to which are attached two exhibitions in Queen's College, Oxford, given by Sir Francis Bridgman, Knt., in 1730; the Boys' British and the Girls' National Schools, supported by subscription, and Sunday schools for adults and children. A savings bank was established in 1816, and on November [illegible]th, 1835, the amount standing in the names of 498 depositors was 17,669*l*. A court of requests for the recovery of small debts is held every six weeks. The manufactures are broad cloth and kerseymeres. A branch of the Wilts and Berks Canal comes up to the town. The market is held on Tuesday, and the fairs are on May 6 and September 29.

The air is salubrious, and the views of the adjacent country are very fine. At Cherhill, about three miles E. of the town, is the figure of a white horse, 157 feet in length, remarkable for the symmetry of its proportions, cut in the chalk down about the year 1780 under the direction of C. Allsup, Esq., surgeon. Bowood, the delightful residence of the Marquis of Lansdowne, is about a mile W. of the town. (*Communication from Calne.*)

CALOCE'PHALUS. [PHOCIDÆ.]

CALOCHORTUS, a beautiful genus of bulbous plants belonging to the natural order Liliaceæ, and nearly allied botanically to the fritillary and tulip, from both which it is immediately known by the sepals being of a different form, colour, and texture from the petals. Several species have been introduced into England from California, where or near which country they are exclusively found wild. Their exact localities, and the precise conditions of climate under which they occur, are however nearly unknown. It would appear that they inhabit a mild climate, subject to rains and a moderately high temperature during their season of growth, but dry and cool subsequently. Accordingly it is found that in this country they do not succeed very well, unless they are cultivated in pits where they are protected from frost and from water stagnating about their roots, and can be exposed freely to light and air when growing. They are so exceedingly impatient of wet near their bulbs when not in a growing state, that prudent gardeners take the precaution to dig them up and keep them dry, from the time when the leaves are withered to the recommencement of their vegetation. When they are replanted, they will scarcely bear any water until the young leaves begin to appear above the soil. Several species are figured in the latter volumes of the 'Transactions of the Horticultural Society,' and in the 'Botanical Register.'

CALOMEL. [MERCURY.]

CALONNE, M. DE, born at Douai about the middle of the last century, studied the law, in which he distinguished himself, and was made successively attorney-general to the parliament of Douai, intendant of Metz, inspector-general of finances, treasurer, [illegible] lastly minister of state. He found the finances in a state of great embarrassment, and being unable to fill up the deficit, he advised Louis XVI. to convoke the assembly of the notables in 1787, before whom he made his well-known statement of the financial affairs of the kingdom. Being taxed with prodigality and malversation he was dismissed by the king, and was succeeded by Brienne. Calonne retired to Flanders, and afterwards to England, where he spent the greater part of his latter years, and wrote numerous political and financial pamphlets. Although belonging to the royalist party he was not extravagant in his opinions, and he therefore incurred the enmity of the more violent royalists. His 'Tableau de l'Europe en Novembre,' 1795; 'Pensées sur ce qu'on a fait et ce qu'on n'auroit pas dû faire,' 8vo. 1796; 'Des Finances publiques de la France,' 1797, &c., afford materials for the history of those times. In 1802 h[illegible]ined leave of Bona-[illegible] to return to France, where [illegible] in October of the

has [illegible]
classes, [illegible]
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town activ[illegible]
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Many vessels [illegible]
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manufactories of s[illegible]
is about 5000. (Sch[illegible]

CALMET, AUG[illegible]

[illegible]EMERA.]
CALORIC. [HE[illegible]
CALORIMETER. [H[illegible]

[illegible]leopterous insects, of the sec-
[illegible]demeridæ. The species are
[illegible] of the posterior legs of
[illegible]y so; the antennæ with
[illegible] the third, more or less
[illegible]gination of the eyes.

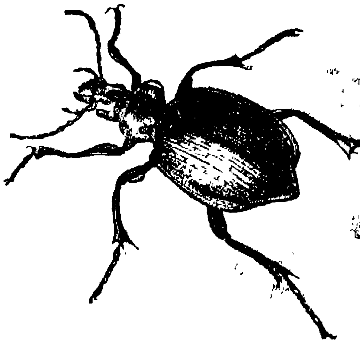
CALOSO'MA, a genus of Coleopterous insects, of the section *Geodephaga* (Mac Leay), and family *Carabidæ*. Technical characters:—Three basal joints of the anterior tarsi, in the males, much dilated, the [illegible] slightly so; antennæ with the third joint longer [illegible] the rest; labrum bilobed; mandibles simple, slightly [illegible] and transversely striated; thorax short; [illegible] generally rather broad and short.

This genus is very closely allied [illegible] the true Carabi; indeed so much so, that it is difficult to point out any very tangible distinguishing characters; and yet the entomologist is seldom puzzled in separating them, even without close examination.

There is a considerable difference in the general appearance of the species of the two genera, and we think this in a great measure arises from the comparative proportions of the head and thorax. In Calosoma these [illegible]e always smaller and considerably shorter in proportion to the body (which is generally broad) than in Carabus. The eyes are usually more projecting, and M. Dejean mentions the larger sized jaws, and their being always transversely striated, as a good distinction.

To the genus *Calosoma* belongs our largest and most beautiful British Carabideous insect, the *C. sycophanta*. It is about an inch long; the head, thorax, [illegible] under parts of the body are of a beautiful blue colour, [illegible] the elytra are green, with red reflections more or less conspicuous in different examples; the legs and antennæ are black.

Most of the best British collections contain this insect, and some even several specimens: it must nevertheless be considered a rare insect in this island, hardly ever more than one specimen having been found at one time. In France and Germany it is not uncommon, and is found in woody districts: most of the British specimens have been taken on the sea coast.



[Calosoma Sycophanta.]

C. inquisitor is the only other species of this genus found in this country: it is about three-quarters of an inch in length, and of a bronze or brassy green above, and black beneath. This species, though by no means common, is far more abundant than the last. It has been frequently met with crawling up the trunks of oak trees in the spring of the year, about the time that that tree begins to put forth its leaves; most probably it feeds upon the young caterpillars, which are then abundant.

Unlike most genera of insects, this appears to be confined to no particular quarter of the globe, species having been met with in almost all countries. About thirty species are known; their prevailing colours are various shades of green, generally of a brassy hue, and sometimes black.

CALOTES. [IGUANIDÆ.]

CALO'TROPIS GIGANTE'A (R. Brown), *Calotropis mudarii* (Buch.), *Asclepias gigantea* of Linnæus. The *Mudar*, a plant common in sandy places in many parts of India, has a milky juice in its stem, which, as well as the bark of the root, enjoyed such reputation among the native practitioners as a medicinal agent as to lead to its use among European practitioners in the East. It was found to be very efficacious in the cure of many obstinate cutaneous diseases, such as lepra, [illegible] and elephantiasis; in syphilitic complaints also and [illegible], it proved so valuable an alterative that it [illegible] the name of vegetable mercury. Some use the powder of the bark of the root, but Sir Whitelaw Ainslie [illegible] the dried milky juice, which in a recent [illegible], if [illegible] in large quantity, is poisonous. It was thought to possess some specific quality, but Sir Duncan, by whom extensive trials were made of it in Britain, showed that [illegible] is not correct, but that it is infinitely more [illegible] common medicinal properties, which correspond [illegible] respect, according to him, both in ki and [illegible] those of ipecacuan. He even thoug that, from the facility with which any quantity could procured from the province of Bahar, the use of the zilian ipecacuan might be altogether dispensed with in our East-Indian settlements.

Besides its practical value as a medicinal agent, the bark of the root possesses the singular property in one of its constituents, *Mudarine*, of being very soluble in cold water, gelatinizing when the solution is heated to 85° or 90° Fahr., and recovering its fluidity on cooling. It is the only instance known of any organic body being an exception to the general law of the power of solvents being increased by an increase of temperature. For this reason we here describe the mode of obtaining it, and give a brief sketch of its habitudes. Mudarine is obtained in a state of considerable purity from the tincture of mudar, by macerating the powder of the root in cold rectified spirit. The greater part of the spirit may be recovered by distillation, but the remaining solution, which acquires a much deeper colour though it remains perfectly transparent, is allowed to cool. As the temperature falls [illegible] granular resin is deposited by a species of crystallization from a transparent coloured solution. The whole is allowed to dry spontaneously, in order that all the resin may concrete. The dry residuum is then treated with water, which dissolves the coloured portion, and leaves the resin untouched. It is to this principle, dissolved by cold water from the resinous extract, that the name Mudarine is given. It has no smell, and is intensely bitter, with a very peculiar nauseating taste. It is exceedingly soluble in cold water at the ordinary temperature of the atmosphere, but insoluble in boiling water. It is soluble in alcohol, but the power of this solvent is increased by increase of temperature. It is insoluble in sulphuric æther, oil of turpentine, and olive oil.

It is in the solution in water when nearly saturated that the peculiar property of Mudarine is most easily exhibited. At ordinary temperatures this solution is quite fluid and transparent. When heat is gradually applied, already at 74° Fahr., a change in its constitution begins to be observable, indicated by a slight diminution of its transparency. As the temperature is raised these changes increase, and at 90° it [illegible] a great degree lost its transparency, and has acquired the consistence of a tremulous jelly. At 95° it is fully gelatinized, and a separation of it takes place into two parts, a soft brownish coagulum, and a liquid nearly colourless. At 98° the coagulum is evidently contracted in size. At 130° the coagulum seems to dissolve: at 185° the coagulum is very small, and has a tenacious, pitchy consistence. At 212° little further change occurs. The alterations which in this state it undergoes on cooling deserve to be noticed. At 140° the fluid is very turbid: the coagulum has not diminished in size, and is now very hard and brittle. At 110° fluid less turbid, coagulum remarkably brittle, with a resinous fracture: at 100° fluid more transparent. When cooled down even to the freezing temperature the coagulum remains unaltered, and very much resembles colophony; but after the [illegible] of several days it gradually liquefies in a portion of fluid in contact with it, without passing through the intermediate state of a jelly.

(Ainslie, *Materia Indica*, vol. i. p. 486; Duncan *in Edin. Med. [illegible] Surg. Journ.* July, 1829; and in *Trans. of Royal Soc. of Edinb.*, vol. xi. p. 433.)

CALOTSA (also Kolotza and Kolosca), an archiepiscopal town, situated in a marshy flat on the Vayas, an insignificant arm of the Danube, in the county of Pesth, in Western Hungary. This place was known to the Romans, and was of much greater importance before the Turks overran the country. It has several handsome public buildings, the most spacious of which is the archbishop's residence, with [illegible] library; a chapter-house and cathedral, an ecclesiastical seminary on a large scale; a college and gymnasium of the Piarist order, &c. The gardens attached to the archbishop's seat are fine; there is an artificial hill in them laid out [illegible] a vineyard. The inhabitants, about 7400 in number, [illegible] on the Danube, and rear much cattle. 46° [illegible] 3′ E. long., about seventy-four miles south [illegible].

CALOYER ([illegible]) [illegible] given to monks, from kalos and geras, meaning comely, venerable old age. They are mostly of the order of St. Basilius, and inhabit convents, the principal of which are on Mount Athos. They are bound to celibacy, which is not the case with the secular clergy or [illegible] Greek church. The Caloyers abstain from me[illegible]rve four Lents in the year, besides other fasts, at [illegible] times they abstain also [illegible]m butter, egg[illegible]d fish, and live only upon bread, vegetables, salt, a[illegible]r. There are also convents of female Caloyers.

CALPE. [Diphydes.]

CALPE. [Gibraltar.]

CALPENTYN GULF, on the N.W. coast of Ceylon. This gulf separates the main land of Pomparippo and that of Putlam from the peninsula of Calpentyn. It is rich in chanks of the best quality, and in bicho de mer. It is plentifully stocked with fish, and supplies water to the salt-pans at Putlam and in the Akkarapattoo.

CALPENTYN TOWN, a peninsulated town on the W. side of the gulf of that name, about 93 miles N. of Colombo. It was antiently called Arasadi, but the natives now call it Kalputti. It has a small square fort built by the Dutch in 1646, containing several handsome buildings, which are at present unroofed and in ruins, except one occupied as the commandant's house, some others used as stores for salt, arrack, and paddy, and one as a prison. The town, situated at a small distance from the fort, contains, besides the mud-thatched huts, only a few large houses roofed with tiles. The extensive groves of cocoa-nut trees with which it is stocked, and the rich foliage of the Sooria, forming a line on each side of the road leading to the bazaar, give it a pretty appearance. In the town and its vicinity are eight places of worship: one Protestant, one Roman Catholic, three Gentoo, and three Mohammedan. It has a charity-school supported by government. The Protestant church, though built of clay and thatched with olas, has stood for nearly two centuries.

The harbour, on account of many shoals, is not accessible to vessels exceeding 100 tons, even at the highest spring tides, so that they are obliged to lie in the Dutch bay at Mutwal, and unload and convey their cargoes to Calpentyn in small boats (dhonies), of which there are a great number belonging to the place.

The exports from Calpentyn to Madras and other ports on the Coromandel coast are copperahs (the edible part of the cocoa-nut, prepared by being dried in the sun to have the oil expressed), cocoa-nuts, oil, shark's fin, coir rope, honey, bees' wax, ghee (clarified butter), fish oil, wood oil, daumer, moss, chaya roots, and palmyra timber. The imports consist of cloths, paddy, rice, crockery, hempen thread, spices, minerals, and drugs. The opening of the new canal between Chilaw and Colombo has proved very beneficial to the inhabitants of Calpentyn, and the trade by means of inland navigation is rapidly increasing. A great number of canal boats (*ballams*) are constantly employed in conveying to the market of Colombo copperahs, salt fish, fish roes, dried shrimps, ghee, in return for the china ware, English cloth, sugar, dates, jackwood planks, tiles, bricks, iron, lead, and a variety of other articles.

The inhabitants are composed of Malabars, Europeans and their descendants, Javanese, and Mohammedans: their number, according to the census of 1831, amounts to 2498. The soil in the vicinity, though very sandy, yields in productiveness to that of few parts of the island. In and about the town are 580 groves of cocoa-nut and palmyra trees. The gardens produce every vegetable and various kinds of fruit. Amongst the latter are mangos, bananas, guavas, papavas, bilibas, pomegranates, citrons, shaddocks, bread fruit, and grapes. The last are produced in great perfection.

The fisheries of Calpentyn have greatly increased within the last few years [illegible] influx of fishermen. The estimated value of the fish caught in 1827 was 1811*l*. The gulf is rich in chanks of the best quality, and in bicho de mer. The latter is occasionally collected and exported to the markets of Singapore and Penang by the Chinese merchants. Chaya roots, finer than can be met with elsewhere, are produced in the neighbourhood; and a species of wood is found here, from which the *wood oil* is extracted. A large quantity of lime is made from shells found here in great abundance.

Calpentyn was probably once the site of an opulent city. Knox describes it as one of the fortified places. The Por tuguese took possession of it in 1541; the Dutch wrested it from them in 1640; and the British captured it in 1795, and have retained possession of it ever since.

CALPU'RNIUS, TITUS JU'LIUS, a Latin poet and a native of Sicily, has left eleven eclogues, written somewhat in the manner of Virgil's, whom he seems to have imitated. He lived in the third century, and enjoyed [illegible] favour of the emperor Carus. His Latinity is better than his taste, and his language more tolerable than his subject or his mode of treating it. [BUCOLICS.] These eclogues have been often edited, and are printed in the 'Poetæ Latini Minores' of Burmann.

CALTHA, a genus of Ranunculaceous plants: two species are met with in this country, one (*C. palustris*) commonly in meadows, and by the side of wet ditches. It is very much like a Ranunculus, from which genus Caltha chiefly differs in having a calyx and corolla mixed together, no scale at the base of the petals, and many seeds in each carpel. It partakes of the acridity of Ranunculus itself.

CALTROP, commonly called Chausse-trape or Crow's-foot, a piece of iron formed with four points, each about three inches long, which are so disposed, that, when the piece is thrown on the ground, one of them will stand upwards. In warfare crows-feet are sometimes scattered about in order to impede the march of cavalry.

CALTURA, a district extending along the S. coast of Ceylon, subordinate to the collectorship of Colombo. Its greatest length from S.E. to N.W. is 38 miles; its breadth from E. to W. 11 miles. It is one of the most healthy and populous districts of Ceylon. The soil is remarkably fertile, the low lands producing three crops of paddy in the year; and the high lands are covered with groves and plantations of cinnamon, cocoa-nut, areca, and other trees. The cocoa-nut tree affords the means of carrying on an extensive distillation of arrack, and the manufacture of cordage and jaggery (a coarse sugar). When the census was taken in 1814 it contained three korles, ten pattois, and 368 villages, and 53,944 inhabitants; of whom were 28,662 Protestants, 6950 Roman Catholics, 6364 Mohammedans, and 12,018 Buddhists.

CALTURA TOWN, the principal town of the district of the same name in the island of Ceylon, situated on the left bank of the Kaluganga river, about 25 miles S. from Colombo; 6° 42′ N. lat: 79° 54 E. long. It has a small fort standing on a neighbouring mound commanding the river, but it is not now garrisoned. It contains about 200 tiled houses. A great number of Jutra Dhonies belong to this port, which trade to Madras and other places on the Coromandel coast. The Wesleyan missionaries have built a handsome chapel and school-house here. There is also an excellent rest-house for travellers, much frequented in consequence of its being in the high road to Galle.

This town is the seat of an assistant government agent, who is also an assistant judge. Its climate is remarkably pleasant and salubrious, and it is therefore a favourite resort of invalids from Colombo. The inhabitants consist of Europeans and their descendants, Cinghalese, and Mohammedans.

CALUMBO, or KALUMBO-ROOT, the bitter tonic root of an African plant called Cocculus palmatus. [COCCULUS.]

CALUMET, the name given by the North American Indians to a pipe for smoking tobacco. In Harris's 'Voyages,' vol. ii., p. 908, the following description of this pipe is given:—'The calumet or pipe of peace is a large tobacco pipe, with a bowl of polished marble, and a stem two feet and a half long, made of strong reed, adorned with feathers and locks of women's hair. When it is used in treaties and embassies, the Indians fill the calumet with the best tobacco, and presenting it to those with whom they have concluded any great affair, smoke out of it after them.' To refuse the calumet is a sign of hostility. It is offered to strangers as a mark of hospitality. To smoke the calumet of peace literally signifies, in the language of the North American Indians, 'to be on terms of friendship and alliance.'

CALVADOS, a department in the north of France, on the coast of the English Channel, forming part of the antient province of Normandie. A remarkable ridge of rocks runs along the coast of France in this part, extending E. and W. about 14 or 15 miles, and ranging a mile or a mile and a half from the shore. (*Map of France* by Maraldi and Cassini de Thury.) Upon this ridge one of the vessels of the Invincible Armada sent by Philip II. of Spain against England (A.D. 1588) su[illegible]pwreck. The vessel was called Calvados, and the name was first imparted to the rocks, and has since been given to the department, which includes the coast over against them. [illegible] department is in its form irregularly quadrilateral. Its greatest length, measured nearly E. and W., is about 72 or 73 miles; its greatest breadth, nearly N. and S., 46 miles; its surface amounts 1,409,606 acres, or about 2202 square miles, being rather below the average extent of the French departments, and rather larger than the English counties of Derby and Stafford taken together. It is included between 48° 46′ and 49° 25′ N. lat., and 0° 26′ E. long. and 1° [illegible]′ W. long. It is bounded on the N. by the sea, on the S. by the department of Orne, on the E. by that of Eure, and on the W. by that of Manche. Caen, the capital of the department, is 122 miles W. by N. of Paris in a straight line, or 134 miles by the road through Mantes, Evreux, and Lisieux. The population of the department in 1832 was 494,702, or between 224 and 225 to a square mile.

This department has no very high hills. It is crossed just at its S.W. extremity by the range of high land which separates the basin of the Loire from that of the Seine and the Orne, or rather by a secondary range extending from this into the peninsula of Cotantin. It is traversed by several streams, all nearly in the same direction, viz., from S. to N. The Vire, near its mouth, and its tributary the Elle, form the western boundary of the department separating it from that of Manche; the Esque, the Tortone, and the Aure Inférieure, unite their streams and flow into the æstuary of the Vire; the Drome united with the Aure (which passes Bayeux); the Seule; the Orne (which passes Caen); the Dives; and the Touques (which passes Lisieux and Pont L'Evêque), successively occur as we cross the department from W. to E. Of these rivers the Vire, the Orne (to Caen), the Dives (to Troarn), and the Touques (to Lisieux), are navigable: the Orne, which is the longest, has a course of about 80 to 90 miles. On the E. the department just reaches to the mouth of the Seine. There is a salmon fishery in the Vire. There are no canals. The high road from Paris to Cherbourg crosses the department through Lisieux, Ceau, and Bayeux; and there are roads from Caen to Avranches (Manche), Vire, Domfront (Orne), and Falaise.

In its agricultural productions this department holds a high place. There are extensive tracts of meadow land, affording excellent pasturage to a prodigious quantity of cattle. According to the statements of M. Dupin (1827) the department contained nearly 100,000 head of cattle, of which by far the greater number were cows. The dairy is much attended to; and a great quantity of butter, salt and fresh, is made. At Isigny, which is the centre of the trade in this article, and the port from whence it is exported, it is said that the annual produce of salt butter is 100,000 pots, valued at 1,500,000 fr. or 62,500*l.* (*Encyclop. Méthod.* 1809.) Many sheep are raised, though in the number of these the department is below the average of France: M. Dupin gives the number of sheep at above 300,000, of which from 12,000 to 13,000 were merinos. The horses of this district are very fine: the breed had much degenerated during the revolution, but is now recovering: the number, according to M. Dupin, is above 50,000, nearly double the average number in the departments. Poultry, game, and fish are plentiful. The grain harvests are copious: the average produce of wheat is nearly double that of the average of the departments, being about 400,000 quarters; the average produce of other kinds of grain is as follows:—buckwheat, 144,000 quarters; barley, 130,000 quarters; oats, 85,000 quarters; rye and mixed corn, 80,000 quarters. There is a considerable export of wheat, but the supply of oats does not equal the consumption. No maize is grown, and not many potatoes. To these articles of produce we may add peas, beans, kidney beans, flax and hemp; dyeing herbs, such as madder, woad, and dyers' weed or weld; fruit, especially apples, from which much cider, the common drink of the inhabitants, is made. Perry is also made, and brandy is distilled from cider. The vine is not cultivated. Salt provisions form one article of trade in the department. The quantity of wood is small: some coal is dug, and some more is imported by sea or by the river Seine. Besides coal, the mineral treasures of Calvados comprise slate, copper, and iron: there are [illegible] springs and mineral waters.

The department is subdivided into the six arrondissements of Bayeux, N.W., population 80,414; Caen, central, pop. 135,502; Falaise, S., pop. 62,349; Lisieux, S.E., pop. 68,716; Pont L'Evêque, N.E., pop. 57,326; and Vire, S.W., pop. 90,395. These are comprehended in the jurisdiction of the *Cour Royale* of Caen. The number of deputies in the Chamber sent by the department is seven. Calvados has one Académie Universitaire (Caen) and one episcopal city (Bayeux), the diocese of which comprehends the department.

The chief towns are Caen the capital, on the Orne, pop. 37,019 for the town, 39,140 for the whole commune; Lisieux, on the Touques, pop. 10,257; Bayeux, on the Aure, pop. 9934 for the town, 10,303 for the whole commune; Falaise, on the Ante, a feeder of the Dives, pop. 9419 for the town, 9581 for the whole commune; Honfleur, at the mouth of the Seine, pop. 8409 for the town, 8888 for the whole commune; Vire, on the river of the same name, pop. 7500 for the town, 8043 for the whole commune; and Condé, on the Noireau, a feeder of the Orne, pop. of the town 490[illegible] of the whole commune 5562. For an account of these towns the reader is referred to their respective articles: the smaller e shall briefly notice her

L'Evêque, on the Touques, is a small town and ill built, with only 1843 inhabitants for the town, or 2118 for the whole commune; yet it is the capital of an arrondissement, and for its size a busy place. A considerable quantity of cotton goods are made here, and some hosiery. There is a sugar-refining-house, and vitriol and copperas are manufactured. There is a high school of good reputation.

Isigny, at the mouth of the Vire, on the right bank, has a population of about 2000. It is famous for the butter, which being made in the neighbourhood is exported from this place chiefly to Paris. The surrounding district is famed for its cider; and the country from Isigny to Bayeux presents a prospect of almost unequalled beauty. Trevières, between Isigny and Bayeux, is famous for its salt butter.

Orbec, on the river of the same name (which joins the Touques at Lisieux), has factories for making light woollens, ribbons, &c. There are some bleach-grounds and tan-yards. The population of the commune in 1832 was 3209.

Vassy, between Vire and Condé sur Noireau, had in 1832 a population of 3243.

The chief manufactures of the department are cotton and woollen goods, lace, hosiery, leather, oil, and paper.

This department comprehends three districts, the inhabitants of which are distinguished by physical characteristics. The inhabitants of the Bocage, the western district, are marked by a lower stature than their neighbours, a pale complexion, lively glance, willingness to labour, strong attachment to their native soil, and tenacious adherence to antient customs: the women are slender but strong and fruitful; they share in the labours of the field. The inhabitants of the plain of Caen are taller, well proportioned, and of fresh complexion, more susceptible of change in their manners, and more influenced by fashion. The people of Le Pays d'Auge, the eastern district, are slow in their movements, and not equal to their neighbours in intelligence.

CALVARY. [Jerusalem.]

CALVERT, GEORGE. [Baltimore, Lord.]

CALVIN, JOHN, was born on the 10th July, 1509, at Noyon, in Picardy, where his father, Gerard Cauvin, was by trade a cooper. His parents being of respectable character, but in humble circumstances, young Calvin, who had early shown a pious disposition, was taken under the protection of a family of wealth in the place, and sent by them to the university of Paris to study for the church. At the age of twelve he obtained from the bishop a benefice in the cathedral of Noyon, to which, in about five years afterwards, was added the cure of Monteville; but this he exchanged, two years after, for the cure of Pont l'Evêque. All this time he was pursuing his studies, and had not even received priest's orders. His father now changed his mind as to the destination of his son, and desired him to turn his attention to the law, as the sure road to wealth and honour. This change was not unacceptable to Calvin, who, from his perusal of the Scriptures—a copy of which was furnished him by Robert Olavetan, who was a fellow scholar, and likewise a native of Noyon—had already been convinced of many of the errors of the Romish church. He accordingly left Paris, and repaired, first to Orleans, where he studied under Peter Stella, and then to Bruges, where Andrew Alciat filled the chair of law; and where also, which was more important to Calvin's future character, Milchior Wolmar, the reformer, taught him the Greek tongue. Here Calvin was confirmed in the doctrines of the reformation, and began indeed to preach them in the villages. His father, however, dying at this time, he returned to Noyon, but after a short period went to Paris, where, in the year 1532, he published his Commentaries on Seneca's two books, 'De Clementia.' He now also resigned his benefices, and devoted himself to divinity. The following year, Cop, the rector of the university of Paris, having occasion to read a public discourse on the festival of All Saints' Day, Calvin persuaded him to declare his opinion on the new doctrines. This brought upon them both the indignation of the Sorbonne and parliament, and they were forced to leave the city. Calvin went to several places, and at length to Angoulême, where he got shelter in the house of Louis Du Tallet, a canon of Angoulême, and supported himself some time there by teaching Greek. It was here he composed the greater part of his 'Institutes of the Christian Religion,' which were published about two years afterwards. The queen of Navarre, sister to Francis I., having shown him some countenance in respect of his learning and abilities, and no doubt also of his sufferings, he returned to Paris, in the year 1534, under her protection, but persecution being again threatened, he quitted France the same year, having first published a work, which he called 'Psychopannychia,' to confute the error of those who hold that the soul remained in a state of sleep between death and the resurrection, and retired to Basil in Switzerland, where he published the 'Institutes,' which he dedicated to Francis I., in an elegant Latin epistle. The design of the Institutes was to exhibit a full view of the doctrines of the reformers; and as no similar work had appeared since the Reformation, and the peculiarities of the Romish church were attacked in it with great force and vigour, it immediately became highly popular. It soon went through several editions: it was translated by Calvin himself into French, and has since been translated into all the principal modern languages. Its effect upon the Christian world has been so remarkable, as to entitle it to be looked upon as one of those books that have changed the face of society. After the publication of this great work, Calvin went to Italy to visit the reformers there, and was received with marked distinction by the learned duchess of Ferrara, daughter of Louis XII. But notwithstanding her protection, the Inquisition opened upon him, and he was obliged to seek safety in flight. He returned to France, but soon left it again, and in the month of August, 1536, came to Geneva, where the reformed religion had been the same year publicly established. Here, at the urgent request of Farel, Viret, and other eminent reformers, by whom that revolution had been achieved, he became a preacher of the Gospel, and professor, or rather lecturer on divinity. Farel was at this time the most distinguished person in the place: he was twenty years older than Calvin, who was in the twenty-seventh year of his age; but their objects were the same, and their learning, virtue, and zeal alike, and these were now combined for the complete reformation of Geneva, and the diffusion of its principles throughout Europe. In the month of November, a plan of church government and a confession of faith were laid before the public authorities for their approval. Beza makes Calvin the author of these productions; but others, with perhaps greater reason, attribute them to Farel. There is little doubt, however, that Calvin was consulted in their composition, and still less that he lent his powerful aid to secure their sanction and approval by the people in the month of July, 1537. The same year the Council of Geneva conferred on Farel the honour of a burgess of the city, in token of their respect and gratitude. But the popular will was not prepared for the severe discipline of the reformers, and in a short time the people resisted some innovations on their religious practices, and, under the direction of a faction, met in a public assembly and expelled Farel and Calvin from the place. Calvin repaired to Berne, and then to Strasburg, where he was appointed professor of divinity and minister of a French church, into which he introduced his own form of church government and discipline. In his absence, great efforts were made to get the Genevese to return to the communion of the church of Rome, particularly by Cardinal Sadolet, who wrote to them earnestly to that effect; but Calvin, ever alive to the maintenance of the principles of the Reformation, disappointed all the expectations of his enemies, and confirmed the Genevese in the new faith, addressing to them two powerful and affectionate letters, and replying to that written by Sadolet. While at Strasburg also, Calvin published a treatise on the Lord's Supper, in which he combated the opinions both of the Roman Catholics and Lutherans, and at the same time explained his own views of that ordinance. Here, too, he published his 'Commentary on the Epistle to the Romans.' Calvin got acquainted with Castalio during his residence at Strasburg, and procured for him the situation of a regent at Geneva; and it was during his stay in this city that, by the advice of his friend Bucer, he married Idellet, the widow of an Anabaptist preacher just deceased.

In November of the same year, he and Farel were solicited by the Council of Geneva to return to their former charge in that city: in May, 1541, their banishment was revoked; and in September following Calvin was received into the city amidst the congratulations of his flock, Farel remaining at Neufchâtel, where he was loved and respected. Calvin did not trifle in the peculiarly favourable circumstances in which he was now placed. He immediately laid before the Council his scheme of church government, and after it was adopted and published by authority, which was on the 20th November, 1541, he was unhesitating in its enforcement. His promptitude and firmness were now conspicuous: he was the ruling spirit in Geneva: and the church which he had established there he wished to make the mother and seminary of all the reformed churches. His personal labours were increasing: he preached every day for two weeks of each month: he gave three lessons in divinity every week, he assisted at all the deliberations of the consistory and company of pastors; he defended the principles of the reformation against all who attacked them; he explained those principles both in writing and discourse: and maintained a correspondence with every part of Europe. Geneva, however, was the common centre of all his exertions, and its prosperity peculiarly interested him, though less for its own sake than to make it a fountain for the supply of the world: he established an academy there, the high character of which was long maintained; he made the city a literary mart, and encouraged all the French refugees and others who sought his advice to apply themselves to the occupation of a printer or librarian; and having finished the ecclesiastical regimen, he directed his attention to the improvement of the municipal government of the place. That Calvin should, in the circumstances in which he was now placed, show marks of intolerance towards others, is not surprising: and to seek a palliation of his guilt we need not go back to the time when he belonged to the Church of Rome, nor yet to the notions of civil and religious liberty prevalent in his age. We have only to reflect on the constitution of the human mind, and the constant care necessary to prevent power in any hands from degenerating into tyranny. His conduct towards Servetus [SERVETUS] has been justly condemned, and has drawn down upon him the epithet of 'a most cruel and atrocious monster:' yet the punishment of Servetus was approved of by men of undoubted worth, and even by the mild Melancthon. In 1554, the year following Servetus's death, Calvin published a work in defence of the doctrine of the Trinity against the errors of Servetus, and to prove the right of the civil magistrate to punish heresy; Beza the same year published a work on the like subject, in reply to the treatise of Castalio. Of all the testimonies to the merits of Calvin at this time, the most unsuspected is that of the canons of Noyon, who, in 1556, publicly returned thanks to God on occasion of his recovery from an illness which it was thought would prove mortal. It was no doubt the state of Calvin's health which prevented him going in 1561 to the famous Conference of Poissy: nothing but his many pains and infirmities, as it appears from his correspondence with Beza, who was sent to the conference from Geneva, would have prevented him attending an assembly which promised to be of so much consequence, and which was indeed remarkable in this respect that from that time the followers of Calvin became known as a distinct sect, bearing the name of their leader. Amidst all his sufferings, however, neither his public functions nor his literary labours ceased: he continued to edify the church of Geneva by his sermons and his intercourse among the people, and to instruct Europe by his works; and to the last he maintained the same firmness of character which had distinguished him through life. On his death-bed he took God to witness that he had preached the gospel purely, and exhorted all about him to walk worthy of the divine goodness: his delicate frame gradually became quite emaciated, and on the 27th May, 1564, he died without a struggle, in the fifty-fifth year of his age. The person of Calvin was middle-sized and naturally delicate; his habits were frugal and unostentatious; and he was so sparing in his food, that for many years he had only one meal in the day. He had a clear understanding, an incredible memory, and a firmness and inflexibility of purpose which no opposition could overcome, no variety of objects defeat, no vicissitude shake. In his principles he was devout and sincere, and the purity of his character in private life was without a stain. His writings are very numerous; but, except his 'Christian Institutes,' his commentaries on the Bible, and a few others, they have long been covered with undisturbed dust, though in their day none of his works were without their influence. There have been various collections of his works. In 1552 all his minor pieces or 'Opuscula' were collected and published at Geneva. In 1576 a similar collection was made of his theological tracts; and the same year Beza published a collection of his letters, with a life of Calvin. We find also in Senebier (*Hist. Lett. de Genere*, tom. ii.) not only a list of all Calvin's publications, but a catalogue of sermons preached by him which yet remain in MS. in the public library of Geneva.

CALVINISM, the system of religious doctrine and church government maintained by Calvin and his followers. Calvin, as we have seen, published his system in his 'Christian Institutes' in the year 1536; but it does not appear to have obtained the name of Calvinism, nor its supporters the name of Calvinists, till the conference of Poissy in 1561. The reformer was not himself present at that assembly, being prevented from attending by his local duties and the ill state of his health; but we see from his correspondence with Beza, the deputy from Geneva, how deep was his interest in its proceedings, and that nothing was done on the part of the reformers without his knowledge and advice. In the debate which took place on the Augsburg Confession, the points of difference between the Lutherans and Calvinists were drawn out; and they were such as that from thenceforth the latter became known as a distinct sect under that denomination.

The tenets of Calvinism respect the doctrines of the Trinity, predestination, or particular election and reprobation, original sin, particular redemption, effectual or irresistible grace in regeneration, justification by faith, and the perseverance of saints; together also with the government and discipline of the church, the nature of the eucharist, and the qualification of those entitled to partake of it. The great leading principles of the system however are the absolute decrees of God, the spiritual presence of Christ in the eucharist, and the independence of the church.

Calvinism was, perhaps, like Lutheranism, exemplified first at Strasburg; where, in the year 1538, Calvin established a French church on his own plan. But it was at Geneva the system was seen in all its vigour; and from thence it spread into France, Germany, Prussia, the United Provinces, England and Scotland. To this last place it was carried by Knox, the disciple and intimate correspondent of Calvin; and as within the little territory of Geneva there was neither room nor need for the parochial sessions, presbyteries, provincial synods and general assembly, into which the presbyterial government expands itself in a large community, we shall briefly advert to its leading features in Scotland as it appeared there in the lifetime of Knox. We shall thus indeed see the church of Scotland in its infancy; but at the same time,—and it is that we have chiefly in view,—we shall thus perhaps have the best idea of the matured opinions of the great reformer.

The Confession of Faith, ratified by the Scots Parliament in 1560, declares* that by the sin of our first parents, 'commonly called original sin, the image of God was utterly defaced in man, and he and his posterity of nature became enemies of God, slaves to Satan, and servants unto sin; insomuch that death everlasting has had, and shall have, power and dominion over all that have not been, are not, or shall not be, regenerated from above, which regeneration is wrought by the power of the Holy Ghost working in the hearts of the elect of God an assured faith in the promise of God revealed in his word;' that 'from the eternal and immutable decree of God all our salvation springs and depends;' 'God of mere grace electing us in Christ Jesus his son before the foundation of the world was laid;' and that

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* We have here modernised the *spelling*.

'our faith and assurance [illegible] the same proceeds not from flesh and blo[illegible] that is to say, from our natural powers within us, bu[illegible] inspiration of the Holy Ghost;' 'who sanctifies us a[illegible] brings us in all verity by his own operation, without whom we should remain for ever enemies to God, and ignorant of his son Christ Jesus; for of nature we are so dead, so blind, and so perverse, that neither can we feel when we are pricked, see the light when it shines, nor assent to the will of God when it is revealed, unless the spirit of the Lord Jesus quicken that which is dead, remove the darkness from our minds, and bow our stubborn hearts to the obedience of his blessed will;' 'so that the cause of good works we confess to be not our free will, but the spirit of the Lord Jesus, who dwelling in our hearts by true faith, brings forth such works as God has prepared for us to walk in;' and 'whoso boast themselves of the merits of their own works, or put their trust in works of supererogation, boast themselves in that which is not, and put their trust in damnable idolatry.' It further admits that 'we now, in the time of the evangel, have two chief sacraments only,' to wit, Baptism and the Lord's Supper; by the former of which we are ingrafted in Christ Jesus to be made partakers of his justice, by which our sins are covered and remitted;' and in the latter it is asserted there is a real though only spiritual presence of Christ, and 'in the supper rightly used, Christ Jesus is joined with us, that he becomes very nourishment and food of our souls.' The marks of a true church are said to be the true preaching of the word of God, the right administration of the sacraments, and ecclesiastical discipline rightly administered as the word of God prescribes. The polity or constitution of the church however is not detailed: this was done in the 'Book of discipline' drawn up by Knox and his brethren. The highest church judicatory is the General Assembly, composed of representatives from the others, which are provincial synods, presbyteries, and kirk sessions. The officers of the church are pastors or ministers, doctors or teachers, and lay elders, to which are to be added lay deacons, for the care of the poor. Among the clergy there is a perfect parity of jurisdiction and authority, and in the church courts clergy and laity have equal voices. The minister and the elder indeed are both *presbyters*—the one a preaching presbyter, and the other a ruling presbyter; and it will be remembered that when Bucer expressed his approbation of the episcopal hierarchy of England, Calvin said it was only another papacy. Another principle, recognised alike by Calvin and the reformers of Scotland, was the education of the people: which both seem to have regarded as the rock upon which the reformed church should be built; and in Scotland, as was fit, this foundation was as broad as the building, it being meant that, besides the universities of the kingdom, there should be in every district a parish church and a parish school.

CALW, or CALBE, a bailiwick in the Würtemberg circle of the Black Forest, about 115 square miles in area, with a population of about 21,300; and containing 3 towns and 32 villages and hamlets. It produces much timber, flax, lime, &c., and has many spinneries, and manufactories of woollens and leather. In a mineralogical point of view it is ext[illegible] interesting. The town of Calw is the chief place [illegible] bailiwick, and is situated on the Nagold, in a narrow [illegible] of the Black Forest, on the acclivity of which part [illegible] built. The town is of very ancient date, and wa[illegible] early part of the 14th century the capital of the [illegible]rldom of Calw. The river divides it into the Upper and Lower towns, which contain 7 churches, about 500 houses, and 4300 inhabitants. It has long been the seat of considerable trade, and has 5 commercial associations, a large manufactory of woollens and kerseymeres, 2 factories for spinning woollen yarn, 3 dyeing works, and manufactures of stockings, leather, lime, &c. It was the birthplace of Pope Victor II., one of the counts of Calw, and of W[illegible], the surgeon who saved the life of Augustus king of Poland, at Bialystock, in 1727. 48° 42′ N. lat., 8° 44′ E. long.

CALX. [CALCINATION.]

CALYCANTHA'CEÆ, a natural order of hardy dicotyledonous plants, well known in gardens for the delicious fragrance of their blossoms. They are in some respects allied to the magnolia, or star-anise plant (Illicium), in consequence of their chocolate-coloured flowers with the segments overlying each other in several rows, and because also of their peculiar fragrance; their true affinity is however with Rosaceæ, as the mass of their characters sufficiently proves; especially the unusual circumstance of the cotyledons of the embryo being rolled up both in this order and in the genus *Chamæmeles* in *Rosaceæ*. (Lindley's *Natural System of Botany*, ed. 2, p. 159.)

Calycanthaceæ consist of but two genera, *Calycanthus* and *Chimonanthus*, which agree in having, 1st, an imbricated calyx and corolla that pass insensibly into each other, and combined at their bases into a thick fleshy tube; 2nd, a small number of perigynous stamens, whose anthers are adnate and are tipped by a projection of the connective; 3rd, several one-seeded nuts enclosed in the tube of the calyx; and 4th, a convolute embryo, destitute of albumen. Their wood is remarkable for the glandular nature of the woody tubes; and for having, in addition to the usual structure of exogens, four imperfect axes with concentric circles, lying at equal distances in the bark near the circumference, on which they produce externally four elevated lines or wheals. The nature of these additional axes constitutes a problem which no one has yet been able to solve.

The two genera are thus distinguished:—*Calycanthus*, or the Carolina allspice, has 48 stamens arranged in four rows, the innermost being rudimentary; and a great many nuts enclosed in a calyx, which is naked at its apex. It consists of small shrubs, natives of North America, with fragrant chocolate-coloured flowers, appearing along with the leaves in May or June.

Chimonanthus, or the Japan allspice, has ten stamens, all perfect and inserted in a double row; only one or two nuts to each calyx-tube, which is crowned and closed up by the permanent recurved stamens. The only species is found wild in Japan, and has fragrant, lemon-coloured blossoms, appearing in the winter after the fall of the leaves. Botanists call it Chimonanthus fragrans, and distinguish three varieties: 1st, the pale kind, which has long been in gardens, and has flowers the colour of which is very slightly yellow; 2nd, the large-flowered, with bright yellow flowers twice as large as those of the last; and 3rd, the small-flowered, which is in all respects the same as the first, except that its blossoms are less than half the size. These plants are multiplied with some difficulty by layering.

CALYCERA'CEÆ, a small natural order of Monopetalous Dicotyledons, differing from Compositæ in nothing but their seeds having albumen, and being pendulous, and in their anthers being only half syngenesious. (Lindley's *Natural System of Botany*, p. 251, ed. 2.)

CALYCIFLO'RÆ, an artificial division of polypetalous dicotyledonous plants, proposed by Jussieu and adopted by Professor De Candolle. It is characterized by the stamens adhering more or less to the side of the calyx; or, in the language of the French school of botanists, being perigynous.

CALYMENE. [TRILOBITES.]

CALYMMA (Zoology), a genus of *Ciliograda*, thus characterized by Eschscholtz:—Body but little elevated, compressed, widened as it were, and provided on each side with a considerable appendage, taking its rise from four other smaller appendages, free at their extremity, near the mouth, and furnished with the series of cilia. The species on which the genus was established was taken in the South Seas near the equator.

CALYPSO (zoology). [GALATHEA.]

CALYPTOMENE. [PIPRADÆ.]

CALYPTORHYNCHUS. [PSITTACIDÆ.]

CALY'PTRA, in botany, a name given to a hood-like body connected in some plants with the organs of fructification. In the genus Pileanthus it covers over the flower, and is formed of united bracts; in Eucalyptus and Eudesmia it is simply a lid or operculum to the stamens, and is produced in the former by the consolidated sepals, in the latter by the petals in the same state: in mosses it is seated upon the end of the fruit-stalk, enclosing the spore-vessel, and is a leaf rolled round the latter and torn away from its base: in Jungermannia it exists in the form of a cup or wrapper at the base of the fruit-stalk, which, instead of carrying it up upon its point, pierces through its apex and leaves it behind.

CALYPTRÆ'IDÆ, a family of gasteropodous mollusks, formerly arranged under the genus *Patella* of Linnæus, and known by collectors as *chambered limpets*, comprising the genera *Calyptræa* and *Crepidula* of Lamarck, with the subgenera into which they have been divided by Lesson.

'When,' says M. Deshayes in his edition of Lamarck, 'collections contained but a small number of Calyptrææ and Crepidulæ, and when the animals of these two genera were unknown, it was natural and proper to preserve them both; but now the resemblance of the animals of these two genera is proved, not only by what M. Cuvier formerly stated in the "Annales du Muséum," but also by the more recent works of M. Lesson, of MM. Quoy and Gaimard, and of Mr. Owen. Already we had perceived in publishing our work upon the environs of Paris, as well as in our articles "Calyptræa" and "Crepidula" in the Encyclopédie, that there existed a great resemblance between the shells of these two genera. One sees in effect, in certain Crepidulæ, the summit taking a spiral shape upon the side of the shell, and raising itself insensibly in a succession of species, so as to show an incontestable passage between the Crepidulæ and spiral Calyptrææ, which we would particularly designate by the name of trochiform Calyptræa. As in the Calyptrææ, properly so called, there exists a certain number of particular forms which may serve to group them in sections, it was necessary to see whether the species, having in their interior a lamina or plate of a funnel shape, afforded proof of a passage to the Crepidula, like those which are trochiform. This passage does exist, so that from the entire facts we may come to the conclusion that the two genera, Calyptræa and Crepidula, ought to be united for the future in the system. This conclusion, which we had in some sort foreseen, has been rigorously drawn and proved by incontestable evidence in the work* lately published by Mr. Broderip, in the first volume of the Transactions of the Zoological Society of London. M. Lesson, in the conchological part of the great work published on the return of the expedition in the corvette *La Coquille*, had attempted to establish in the united genera Calyptræa and Crepidula many subgenera, of which some have been adopted by Mr. Broderip, as sections of the entire genus Calyptræa. These sections, of which some persons think that they can make genera, are connected one with another by the strongest affinities, and cannot be separated into genera on account of the resemblance of the animals.'

Deshayes then proposes the following sections of the great genus *Calyptræa*:—

1. Those which have in their interior, and fixed to the summit, a shelly plate, hollowed out into a sort of gutter, which may be compared to a hollow cone of paper cut longitudinally in two, and of which one portion has been removed. (*Calyptræa equestris*.)

2. Those which have a delicate plate or lamella in the form of a funnel, fixed either to the side or to the summit. A well-defined section, presenting nevertheless a passage towards some of the Crepidulæ.

3. Uniting all the species from those which begin to have a very short lamella attached to the internal side (*Calyptræa extinctorium*), to those whose lamella forms spiral turns (*Calyptræa trochiformis*), the gradations being very insensible. To this section M. Deshayes thinks that many of Lamarck's Crepidulæ should be referred.

4. Crepidula properly so called. This section he says might be subdivided, taking for a basis of the subdivision characters of less value than those relied on for forming the four principal sections.

Our limits will not permit us to illustrate the several gradations of form by representations of the different species; and they are so numerous, and glide so imperceptibly into each other, that to give a few marked distinctions would be calculated to mislead. Some idea of the variety of shape to which the shells are subject may be obtained from the following passage in Mr. Broderip's paper:—'I have before me specimens taken from under the same stone, evidently of the same species, varying in shape from a regular high cone to an almost flat surface, with nearly every intervening irregularity of circumference that can be imagined.' We must therefore refer the reader to the three plates illustrative of Mr. Broderip's paper for numerous examples of the forms of the shells, and to those of M. Cuvier, M. Deshayes†, and Mr. Owen, for the anatomy of the animal. For the method of arrangement proposed by M. Lesson, his Memoir in the second volume of the 'Zoologie de la Coquille' may be consulted; but the student is desired to bear in mind that, in the figure of *Calyptræa* (*Crepipatella*) *Adolphei* ('Zoologie de la Coquille, Atlas, Mollusques, pl. 15, fig. 2, *a*.') the position of the head of the animal is wrong, as Mr. Broderip has pointed out, its real situation being nearly opposite to the point which it occupies in M. Lesson's plate.

Geographical distribution.—The species are numerous and widely diffused; but the great development of the form is to be found in warm climates, where many of the species attain considerable size, and are remarkable for their form and the richness of their colour. They are found sticking on rocks, on and under stones, on other living and dead shells, and submarine substances, at depths varying from the surface to forty fathoms, on sea-coasts, in estuaries, and in tidal rivers.

FOSSIL CALYPTRÆIDÆ.—Some of these are both living and fossil, others fossil only, and are given in Deshayes's tables, which apply to the tertiary beds only, as occurring in the Pliocene, Miocene, and Eocene periods of Lyell, respectively.

CALYX, the external wrapper of a flower within the bracts. Usually it is green and leaf-like, sometimes however it is coloured like a corolla, from which it is only known by its being the outermost of the rows of floral envelopes. It consists of leaves called sepals, which are sometimes separate when the calyx is polysepalous, and sometimes united into a sort of cup by the edges, or monosepalous. Occasionally it is converted into feathery or short divisions, when it is named pappus; or it is altogether reduced to a small rim, so as to be hardly visible. In some plants it grows to the sides of the ovary, and is technically called *superior*, while it is named *inferior* if it is quite separate from that part. Its segments are usually of the same number as those of the corolla, and alternate with them. The office of the calyx appears to be, in its ordinary green state, merely that of protecting the tender parts that are formed within it; but when it is coloured and similar to a corolla, we can scarcely doubt that in such cases it also performs the part of a corolla. [COROLLA.] In some instances, as in that of pappus, it seems merely intended as a means of transporting seeds to a distance by enabling them to catch the wind by the wings which it at that time, resembles.

CAMALDOLENSES, CAMALDOLITES, a religious order founded by St. Romualdo, at the beginning of the eleventh century. The order was a reform of that of the Benedictines, whose constitutions St. Romualdo retained, with some modifications of additional strictness, one of which is the silence enjoined to members of the community. The dress of the Camaldolites is white, and they wear their beards long. The first establishment of the order was in the high Apennines, above the Casentino, or valley of the Upper Arno, E. of Florence, from the summit of which, on a clear day, both the Adriatic and the Mediterranean are visible. A proprietor called Maldulo gave to St. Romualdo, in 1009, a piece of ground in these mountains, where the first cells of the monks were built; hence the name of Campus Maldoli, and by corruption Camaldoli. The cells, with their respective gardens, are now abandoned, but the church remains, though stripped of its ornaments. The spot is called the Eremo or Hermitage; but the monks live in a large convent a mile lower down, at a place called Fontebuona, where they have another church, in which are some good paintings by Vasari. A good library with valuable MSS., and the old archives of the convent, and a collection of paintings, were dispersed at the time of the suppression of the convent by the French, in 1810. The monks are possessed of part of the neighbouring forest, which abounds in large fir-trees, and they have always been remarked for their economical and intelligent management of this kind of property. During the few years of the suppression of the convent, the forest has much deteriorated, the trees having been cut down injudiciously, and without being replaced by fresh plantations. (Repetti, *Dizionario Geografico Fisico della Toscana*, 1834.) The order of Camaldolites is possessed of convents in various parts of Italy, mostly built in secluded and elevated situations. There is one near Naples, on a mountain above the lake of Agnano, well known for the splendid view which it commands, and another at Monte Corona in the Apennines, near Perugia. The order of Camaldolites has produced many learned men; among others Fra Mauro, a [illegible]r of the fifteenth century, Father Traversari, a [illegible]lologist, besides the historians of the order. The present Pope, Gregory XVI., belongs to the order. They had a printing-press attached to their convent in the Tuscan Apennines.

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* 'Descriptions of some new species of Calyptræidæ.' By W. J. Broderip, Esq., Vice-President of the Geological and Zoological Societies, F.R.S., L.S., &c., vol. i., p. 195.

† In the 'Annales des Sciences Naturelles.'

CAMARGUE or **CARMAGUE**, Isle of. [BOUCHES DU RHÔNE, DEPARTMENT OF.]

CAMARI'NA (Καμαρινα), a town in the S. of Sicily, on the river Hipparis very near the sea. Camarina was a Dorian town (Thucyd. iii. 86), the most considerable of the Syracusan colonies (Strab. vi., p. 272, *a*, Casaub.), founded B.C. 600 (Clinton, F. H., vol. i., p. 226, 2nd edit.), 135 years after the foundation of Syracuse from Corinth (Thucyd. vi. 5.). The situation was unhealthy, owing to the neighbourhood of a marsh which was formed by the river Hipparis: this marsh however was so great a safeguard against the attacks of enemies, that it was considered that the draining of it would be fatal to Camarina. Hence the proverb *μὴ κίνει Καμαρίναν* (*ne moveas Camarinam*); which implied that, although the marsh was an evil, the danger which would attend its removal would be a greater one. Only a few ruins now remain, bearing the antient name. Few towns have undergone so many and remarkable revolutions as Camarina. Some time after its foundation (Thucydides does not say how long) it revolted from the mother state, and the town was destroyed (Thucyd. vi. 5.). The Syracusans were afterwards forced to cede Camarina to Hippocrates, tyrant of Gela, who however colonised it afresh (Thucyd. vi. 5.). Gelon, the successor of Hippocrates, destroyed the town again (Herod. vii. 156), and removed the inhabitants to Syracuse. He appears to have subsequently rebuilt it (Raoul-Rochette, *Colon. Grecq.* iii. p. 358). The inhabitants were again driven out by Dionysius the elder, B.C. 404, and moved to Leontium. The town was afterwards restored and enriched by Timoleon (Diodor. Sicul. xvi. 83), B.C. 336. In the year 401 B.C., it was again stormed and taken by the Carthaginians. (Diodor. Sicul. xxiii. p. 320, Bipont edit.)

Coin of Camarina.

[Brit. Mus. Actual size. Silver. 266 grains.]

CAMAROONS or **CAMAROENS**, a river of Africa, which discharges itself into the Bight of Biafra and into the same æstuary as the Malimba, about 45 miles to the E. of Fernando Po. It has a bar across its mouth, with an average depth of from 15 to 18 feet water over it. Of this river little is known beyond a few miles from the entrance. Like the other rivers on this coast, it is a great mart for slaves. Palm oil and ivory are also obtained here; the latter is considered very fine.

The system of traffic is by barter, and the articles in demand the same as the Calabar. This river is separated from those to the westward by high land called the Camaroon mountains, the highest peak of which rises to 13,000 feet above the sea, and is generally capped with snow. The name is derived from the Portuguese word for shrimp, of which there is a great abundance. Each side of the river is governed by a separate chief, whose friendship must be purchased by presents before any traffic is commenced.

CAMBACE'RES, JEAN JACQUES DE, was born at Montpellier in 1753. His father was an advocate, and brought him up to the same profession, in which he soon distinguished himself, and was made Counsellor of the Cour des Comptes of Montpellier. When the revolution broke out he was elected deputy to the Legislative Assembly, and afterwards to the Convention, where he voted for the death of Louis XVI., but with a conditional reprieve. In the subsequent period of terror he endeavoured, though cautiously, to bring back the Assembly to legal measures, and to check arbitrary acts. He afterwards sat in the Council of Five Hundred, and was made Minister of Justice under the Directory, in which capacity he greatly assisted Bonaparte in the revolution of the 18th Brumaire. From that moment he followed the fortunes of Napoleon, and was among his most useful and subservient instruments: he was also one of the few who remained faithful to him to the last. In his capacity of Great Chancellor of the empire, he had to communicate to the senate all Napoleon's measures for peace or war, including his frequent demands for fresh conscriptions of men, which were sanctioned by that docile assembly. Cambacères was one of the compilers of the civil code, for which his legal knowledge rendered him very well qualified. He had already written, in 1796, a *Projet de Code Civil*, which became in a great measure the basis of the new code. After Napoleon's first abdication in 1814, Cambacères lived in retirement at Paris. When Napoleon returned from Elba, he appointed Cambacères Minister of Justice, notwithstanding his excuses. After the king's second return, Cambacères withdrew again to private life, and in February, 1816, he went to reside at Brussels, being included in the list of those who were exiled from France for having voted for the death of Louis XVI. However, in May, 1818, the king reinstated Cambacères in all his civil and political rights, in consequence of which he returned to Paris, where he died in 1824. His manners were courteous and pleasing: he was liberal and hospitable, and had the reputation of giving the best dinners of any of the ministers and great officers of the empire.

CAMBAY, GULF OF, formerly known as the gulf of Barygaza, is situated on the N.W. coast of India, and extends from the southern extremity of the peninsula of Gujerat in 20° 40′ N. lat. and 71° 7′ E. long. to the city of Cambay, a distance of 130 miles. In consequence of the currents and the *bore* which occur in this gulf, its navigation is dangerous. [BAROACH.] The waters of the Saubermutty, the Mhye or Mahy, the Dhandur, the Nerbudda and the Tuptee rivers discharge themselves into this gulf.

CAMBAY, a large city, supposed to be the *Camanes* of Ptolemy, situated at the mouth of the Mhye river and at the head of the Gulf of Cambay, in 22° 21′ N. lat. and 72° 48′ E. long. When Gujerat was an independent state, Cambay, as the sea-port of its capital Ahmedabad, enjoyed a high degree of commercial prosperity, which it has since lost. The city contains several mosques and Hindoo temples, and the remains of many more religious edifices, the greater part of which appear to have belonged to the sect of Jains, whose religion was formerly predominant in this part of India.

The trade of Cambay formerly embraced the export of silk and chintz goods, jewellery, and indigo, but at present nearly all its export trade consists of grain sent to Bombay. The surrounding country is fertile, and furnishes an abundance of wheat, oil, seeds, and the other grains usually raised in this part of India. The silversmiths of Cambay still retain their superiority in the art of embossing.

Until the beginning of the present century the city and territory of Cambay were governed by a native prince who was tributary to the Maharattas, but on the overthrow of the Peshwa the British succeeded to his rights, and the prince now pays tribute to the East India Company's government. (Vincent's *Periplus*; Rennell's *Memoir of a Map of Hindustan*; Mill's *History of British India*.)

CAMBING GUTANG. [ANTELOPE, Species 27.]

CAM'BIUM, a viscid substance that appears in the spring between the wood and bark of exogenous trees. It is supposed to be intended, firstly, to lubricate the faces of the wood and bark, so as to enable the new woody matter of the branches to descend the more freely; and secondly, as a means of nourishing and consolidating the young tissue of which the horizontal and vertical systems of a tree equally consist. This substance disappears every spring after the complete formation of the wood, which then adheres firmly to the bark; but it re-appears whenever the plant is again called into growth, as at midsummer in those species which shoot twice a-year, like roses, peaches, &c.

CAMBO'DIA, or rather **CAMBODJA**, by the natives called Kan-phutchi, is a very extensive country in the peninsula without the Ganges. It comprehends all the countries on both sides of the river Maekhaun, or Cambodia river, from its mouth as far as 15° N. lat. It seems to have existed for a great length of time as an independent empire, whose princes from time to time sent presents and sometimes tribute to the Chinese court. But dissensions in the reigning families, and contests about the succession to the throne, by degrees reduced its power and weakened its stability. In an unsuccessful war with the Siamese, Cambodia was obliged to call to its aid the Cochin Chinese, and at its termination it became tributary to the latter. The revolutions which occurred in Cochin China towards the end of the last century restored Cambodia to its independence; but new quarrels soon arose, which placed the country, in 1786, under the dominion of Siam. One of the pretenders to the throne having applied in 1809 to the Cochin Chinese for help, they entered the country with a considerable army, and met the Siamese; but before they came to a battle they agreed to divide the country between them. The Siamese retained the province of Batabang, which is contiguous to their other territories; and the remainder was united to the kingdom of Cochin China or Anam. (Crawfurd's *Journal*, &c.)

CAMBOGE. Though this gum-resin [illegible] introduced into Europe by Clusius about 1603, the tree which yields it is not accurately ascertained. All writers agree in referring it to the tribe of the Guttiferæ, and the latest authorities point to Stalagmites Cambogioides (Murray), which according to Wight and Arnott is a species of Garcinia (probably synonymous with Garcinia cochinchensis (Chois.), the Oxycarpus cochinchensis of Louriero), as the source of the Siam camboge; while that of Ceylon is stated to be obtained from the Xanthochymus ovalifolius. (Roxb.) Others assign the Ceylon camboge to the Mangostana Morella. (Derous. in Lamarck's *Encyclo.* vol. iii. p. 701.) This last point it is of less importance to settle, if the statement of Dr. Christison be correct, that Ceylon camboge is not now an article of European commerce, all which is found in the markets of this country coming from China.

From the bruised leaves and young branches of the first-mentioned tree flows a yellow juice, which is received in cocoa-nut shells or earthen vessels; it is then allowed to thicken, and afterwards formed into rolls. This is the finest sort, called the pipe camboge of Siam. A portion is formed into round cakes, which are either entire or have a hole in the centre. This is the cake camboge of Siam.

The juice from the Xanthochymus ovalifolius flows spontaneously, but sparingly; it is increased by incisions in the stem, and by kindling fires in the vicinity of the tree. The colour of both kinds differs according to the season of the year, the age, and part of the tree from which the juice is obtained. The Siam camboge occurs in pieces of variable size, externally of a dirty yellowish brown colour, covered with a fine yellow powder. When broken they exhibit a conchoidal or vitreous fracture, with a brown or saffron-yellow colour.

At the ordinary temperature of the air camboge has little smell, but when heated gives out a very peculiar one. Taken into the mouth it has scarcely any perceptible taste, but upon being chewed for some time it causes a sharp, somewhat acrid feeling, ending in a sweet sensation, accompanied with dryness in the mouth. It excites afterwards a flow of saliva, which is coloured yellow. Its specific gravity is 1.207. A specimen of pipe camboge of Siam, analysed by Dr. Christison, yielded as follows:—

Pipe Camboge of Siam.		Cake Camboge of Siam.	
Resin	72·2	Resin	64·8
Arabin	23·0	Arabin	20·2
Moisture	4·8	Fecula	5·6
		Lignin	5·3
		Moisture	4·1

Of Ceylon camboge one specimen yielded—

Resin	75·5
Arabin	18·3
Cerasin	0·7
Moisture	4·8

The cake camboge is not entirely a natural production, but a manufactured article.

Camboge is almost entirely soluble in alcohol, and is not precipitated from solution by the addition of water. With water it forms an emulsion, in which the resin is kept suspended by the gum. It is soluble in the alkalies. The resin may be considered its active principle. It is remarkable that a substance possessed of such slight sensible qualities, having no smell, and scarcely any taste, should be so powerful in its action on the human frame. It is a drastic purgative; and, in combination with alkalies, forms a most powerful hydrogogue cathartic, occasioning numerous copious watery motions. In an overdose it causes excessive purging, sometimes vomiting, and if taken in large quantity, it produces inflammation of the intestines, mortification, and death.

The diseases in which it is most useful are ascites, or dropsical accumulations in the cavity of the abdomen, especially if accompanied with obstructions in the liver, or other abdominal viscera. It has also been employed against the tapeworm, and obstinate or habitual constipation. The doses must be carefully regulated, and only taken by the order of an intelligent and responsible medical attendant. Its use as a quack medicine has led in many cases to fatal results.

Yellow juices, which when inspissated form a substance resembling camboge, are obtained from several trees, both of the tribe of Guttiferæ and Hypericaceæ. Garcinia pictoria is stated by Mr. Royle (*Flora of the Himalaya*, p. 132) to yield a camboge, which in its crude and unprepared state is superior to every other kind; but it is not so [illegible] The Garcinia celebica (Linn.) likewise furnishes [illegible] Several species of Vismia (Hypericaceæ) yield a [illegible] camboge of good quality;—V. sessilifolia (Pers.), [illegible]nensis (Pers.), V. cayennensis (Pers.), V. micranth[illegible] Vismia baccifera (Mart.). The Hypericum [illegible] (Roxb.) also yields a sort of camboge; and the [illegible]one mexicana.

Camboge is more extensively used as a pigment than as a medicine.

An artificial camboge is manufactured with turmeric and other materials. This should always be rejected.

CAMBRAY or CAMBRAI, an important city of France, in the department of Nord. It is on the eastern or right bank of the Escaut or Scheld, 100 miles in a direct line N.N.E. of Paris, or 105 miles by the road through Senlis, Roye, and Peronne; in 50° 10′ N. lat. and 3° 14′ E. long.

In the latter period of the Roman empire this city rises to notice under the name of *Camaracum*, by which it is mentioned in the Itinerary of Antoninus and the Theodosian table. In the Notitia Provinciarum it appears as one of the capital towns of the Nervii; Turnacum (Tournay) being the other. In the infancy of the Frankish monarchy in Gaul, Cambray is said to have been the capital city of Clodion, the son of Pharamond (A.D. 427—448), and to have given title to his kingdom. Charlemagne fortified the town, and Charles le Chauve (the Bald) ceded it to its bishops, by whom the sovereignty of it was long retained. It had its castellans or viscounts, who paid homage and allegiance to the bishop. In 1510 the Emperor Maximilian I. erected Cambray into a duchy and principality of the empire in favour of the then bishop and his successors. In 1543 the Emperor Charles V. rendered himself master of the place, and erected the citadel, one of the strongest in Europe, on a height at the eastern extremity of the city. In 1581 this city, which was in the hands of the Protestants of the Netherlands, was besieged by the prince of Parma, but the approach of the duke of Alençon with succours compelled him to raise the siege. The fortifications were much strengthened by Vauban. In the advance of the allied armies after the battle of Waterloo, Cambray was taken by escalade, 24th June, 1815, by a detachment of the English army, commanded by Sir Charles Colville.

The city of Cambray is large; the streets are of tolerable width, but not regularly laid out, and there are a great number of old houses that present their gables to the street. The Place d'Armes is capable of containing all the garrison drawn up in order of battle. There are some handsome public buildings. The cathedral contains a monument of Fénelon, and its steeple is remarkable for the delicacy of the architecture. The town house is a handsome modern edifice. The episcopal palace is a large building.

Considerable manufactures are carried on at Cambray. Its lawns and fine linens have acquired such reputation that their name has passed in Great Britain into a general designation (Cambric) for goods of that sort. Handkerchiefs like those of Madras are made here; also cloths, hosiery, lace, carpets, and white leather, common earthenware, and soap. The population of the town in 1832 was 14,510, that of the whole commune 17,646.

The navigation of the Escaut commences at Cambray, and opens a communication with those parts of the Netherlands which are watered by that river. Cambray has also a communication with St. Quentin by canal, which is connected with the navigation of the Somme [illegible] one hand, and the Oise on the other.

There are in the town a theatre, a school [illegible] anatomy, a seminary for the priesthood, a high school and a public library of 27,000 volumes.

Cambray was early the seat of a bishopric. In 1562 the bishop was raised to the rank of archbishop, and had the bishops of Arras, Tournay, St. Omer, and Namur given to him as his suffragans. This archbishopric was held by the pious Fénelon. In the changes which have resulted from the French revolution the see has [illegible] again reduced to the rank of a simple bishopric. The [illegible] is a suffragan of the archbishop of Paris, and has for [illegible] diocese the department of Nord.

Cambray is the capital of an arrondissement, which had in 1832 a population of 152,444.

CAMBRESIS, a district formerly in the Low Countries, now included in France, having Cambray for its capital. It is a s[illegible] district, bounded on the N. and E. sides by the county of [illegible]t, on the S. by the districts of Vermandois and T[illegible] in Picardie, and on the W. by the county of Artois. I[illegible] country, watered by the Escaut or Scheld and its [illegible] (the Senset and the Selle), and by the Sambre, a[illegible]f the Meuse. It produces grain of all sorts, and [illegible], a[illegible]rds pasturage to many sheep and horses.

It w[illegible]ally part of the territory of the Nervii, a tribe of [illegible] Belgæ; under the Roman empire it was included in the province of Belgica Secunda, and on the downfall of the Western empire came into the hands of the Franks. Being subsequently comprehended in the Germanic empire, it was erected by the emperors into a county, held for 400 years by laymen, but afterwards ceded to the bishops of Cambray. It was appropriated by Charles V.; and though during the troubles of the Netherlands the possession of it was contested, it remained to the Spanish branch of the Austrian family. In 1677 it was conquered by Louis XIV., and confirmed to France, from which it has not since been separated, by the peace of Nimeguen, 1678.

The three chief places are Cambray (population, 14,510, town; 17,646, whole commune), Le Cateau (population, 5814, town; 5946, whole commune), and Crevecœur (population, 1776, town; 2001, whole commune).

CAMBRIDGE, the county town of Cambridgeshire, is in the hundred of Flendish, about 48 miles (direct distance) N. by E. from London. It takes its name from the more modern appellation of the river on which it is situated, the antient name of which was Granta, and is still retained above Cambridge. In the record of Domesday the town is called Grentebrige: Grantchester is now the name of a small village near Cambridge. The first well-authenticated fact relating to its history is the burning of it by the Danes in 871, and it is again mentioned as destroyed by the same enemies in 1010. While the isle of Ely was held against William the Conqueror by the English nobility, that monarch built a castle at Cambridge—Grose says in the first year of his reign; Ordericus Vitalis says in 1068. That the town had risen to considerable importance at the time the Domesday Survey was formed, is evident from the description of it in that record. In 1088 Cambridge shared the fate of the county in being laid waste with fire and sword in the cause of Robert Curthose. To compensate the impoverishment of the townsmen in this calamity, King Henry I. exempted them from the jurisdiction of the sheriff, upon condition of their paying 101 silver marks annually into the exchequer, which rent had till that time been paid by the sheriff. It appears, nevertheless, that in the succeeding reign the burgesses gave the sum of 300 marks of silver and one mark of gold for a confirmation of this privilege.

In 1174, a fire happened at Cambridge which, among other extensive damages, injured most of the parish churches, and destroyed that of the Holy Trinity. King John, in the first year of his reign, in consideration of 250 marks, granted the townsmen of Cambridge the same privileges as the king's free and demesne burgesses. In the following year he granted them a mercatorial gild, with extensive privileges; and in 1207 the liberty of being governed by a provost, to be chosen annually by themselves. The style of their government was afterwards altered by King Henry III. to that of a mayor and four bailiffs.

King John was at Cambridge on the 16th Sept., 1216, about a mon[illegible] before his death. On his departure he intrusted the [illegible]ce of the castle to Fulco de Brent, but it was soon afte[illegible]en by the barons; and after the king's death a counc[illegible] held at Cambridge between the barons and Louis the [illegible]hin. In 1249 we have the first notice of great discord [illegible]ween the townsmen of Cambridge and the scholars of the university. Subsequent dissensions between them frequently occur in different periods of their annals. In 1381, in consequence of the lawless proceedings of the townsmen in destroying the charters of the university and those of Benet College, King Richard II. deprived the burgesses of their charter, and bestowed all the privileges with which they had been invested [illegible] the university. Not long after this event, in 1388, the king held a parliament at Cambridge. Nothing remarkable occurs in the history of Cambridge for the next two centuries, except a royal visit from King Henry VII. in 1505, and the restoration of their charter to the burgesses by Henry VIII. with abridged privileges, by which they were rendered more subordinate to the university than they had been under their former charter. Upon the first symptoms of an approaching war between King Charles I. and his parliament the university of Cambridge demonstrated their loyalty; but in 1643 Cromwell, who had twice represented the borough, took possession of the town for the parliament, and put in it a garrison of 1000 men. In the month of August, 1645, the king appeared with his army before it, but we have no account of any siege or assault upon the town; nor does anything occur which connects it with the civil history of the country from that to the present time.

The corporation, till the passing of the late Municipal Reform Act, consisted of a mayor, twelve aldermen, twenty-four common-council-men, four bailiffs, a high steward, recorder, town-clerk, and other officers. The governing body now consists of a mayor, ten aldermen, and thirty councillors. The mayor upon entering into office takes an oath to maintain the privileges, liberties, and customs of the university.

When the Survey of Domesday was taken, the town of Cambridge contained 373 masuræ or messuages, of which 47 were in ruins, and 27 had been destroyed for the purpose of building the castle. In 1377 the number of persons in Cambridge charged to a poll-tax (from which the clergy, children under fourteen years of age, and paupers were exempted) was 1722. In 1749 the number of houses was 1792, of which 156 were inns and public-houses; the number of inhabitants 6131. In 1801 the number of inhabitants, exclusive of the university, was 9276; and in 1811, 10,294. The population, including the university, in 1821, was 14,142; and in 1831, 20,917. Although the town was so much smaller when the Domesday Survey was taken, it was then divided into ten wards; the subsequent division was into four, but under the Municipal Reform Act it has been divided into five wards.

The parishes are fourteen in number:—All Saints, St. Andrew the Great, St. Andrew the Less or Barnwell, St. Benet, St. Botolph, St. Clement, St. Edward, St. Giles and St. Peter united, St. Mary the Great, St. Mary the Less, St. Michael, St. Sepulchre, and Trinity; besides which there are said to have been formerly the churches of St. John, St. Nicholas, St. Zachary, St. Peter without Trumpington Gate, All Saints in the Jewry, and the Chapel of St. Edmund. None of these are handsome buildings. St. Sepulchre's church is one of the few churches in England that has a round tower. It was built in imitation of the church of the holy sepulchre at Jerusalem.

The town of Cambridge has sent members to parliament from the earliest period of our parliamentary records, and it still sends two members. No alteration was made in the boundaries of the borough under the Municipal Reform Act.

Of the public buildings of Cambridge the castle, which is said to have been erected on the site of a Danish fortress, has been already mentioned. It was suffered to go to decay at least as early as the reign of Henry IV. All that remains of the antient buildings is the gate-house. A county-gaol has since been erected close to it, from a convenient and extensive plan of John Howard. The shire-hall, in which the assizes and quarter-sessions for the county are held, was built in 1747. The town-hall, belonging to the corporation, was built in 1782; opposite to which is a conduit, erected in 1614 by Thomas Hobson the carrier, who left lands for its repair.

Among the religious foundations antiently existing in Cambridge not connected in their origin with the university, were, the house of Austin Canons, founded in 1092, originally placed in or near the church of St. Giles; the Benedictine nunnery of St. Rhadegund, now forming a part of Jesus College, founded in 1130; the Grey Friars or Franciscans, founded soon after 1224; the Bethlemite Friars in 1257; the Friars de Sacco, 1258; the Dominican or Black Friars, founded before 12[illegible]; the house of Brethren of St. Mary, in the parish of All Saints, 3 Edward I.; the Austin Friars, founded in or near the Fishmarket, called Ease-hill, about 1290; the White Friars, brought from Newenham in 1291; the Gilbertine Canons, established about the same time; the Hermitage of St. Anne and Hospital of [illegible]ry Tangmer before 1397; and the antient Hospital of St. Mary Magdalen for Lepers at Stourbridge.

A fair was held at Cambridge from very antient times in Rogation Week. It was recognized and confirmed in a charter of the 2nd of King John. Another, at the festival of the Assumption of the Virgin Mary, was granted by King Henry VI. to the nuns of St. Rhadegund in 1438. In the parish of Little St. Andrew or Barnwell are held Midsummer Fair and Stourbridge Fair, which are annually proclaimed by the principal officers of the university with much solemnity; the former was held for a fortnight on a common called Midsummer Green; the latter, supposed to be of very great antiquity, is proclaimed on the 18th of September, and used to continue for three weeks. The duration of both fairs has been considerably shortened. Cambridge market, which has been held from time immemorial on Saturday, is a great mart for corn and butter. Brawn and Stilton cheese are also considerable articles of trade.

By means of locks the Cam is now navigable up to Cambridge, and by it the town is supplied with coals, &c. through Lynn, where the Ouse enters the sea.

(Gough's edit. of Camden's *Britannia*; Lysons's *Magna Britannia* for Cambridgeshire; and Merewether and Stephens's *History of Boroughs and Municipal Corporations*, 3 vols. 8vo. London, 1835.)

CAMBRIDGE, UNIVERSITY OF. The first establishment of this university is involved in much obscurity. Although some writers have carried back its origin to a more remote date, it seems probable that Cambridge first became a seat of learning in the 7th century: when, as Bede (*Hist. Eccl.*, lib. iii. c. 18) informs us, Sigebert, king of the East Angles, with the advice of Felix the bishop, instituted within his kingdom a school for learning, in imitation of what he had seen in France: this school is presumed to have been fixed at Cambridge. It is certain that from a very early time Cambridge was the residence of numerous students, who at first lived in apartments hired of the townsmen, and afterwards in inns or hotels, where they formed a community under a principal, at their own charge. Some say that Edward the Elder, when he repaired the ravages of the Danes at Cambridge, erected halls for students, and appointed professors; others maintain that a regular system of academical education was not introduced till the year 1109, when the abbot of Croyland having sent some learned monks, well versed in philosophy and other sciences, to his manor of Cottenham, they repaired to the neighbouring town of Cambridge, whither a great number of scholars flocked to their lectures, which they arranged after the manner of the University of Orleans.

The first charter known to have been granted to Cambridge as a university is that of the 15th Henry III., which grants the privilege of appointing certain persons, called taxors, to regulate the rent of lodgings for the students, which had been raised to an exorbitant height by the townsmen: this was almost fifty years before the foundation of Peter-house, the first endowed college. In 1333 King Edward III. granted the university some important privileges. These distinguished favours caused the townsmen to be more than ever jealous of the authority of the university, and their discontents, as already noticed in the account of the town, at length broke forth into open violence in the succeeding reign, when, emboldened by the temporary success of Wat Tyler and his associates, they seized and destroyed the university charters.

In 1430, Pope Martin V. determined, from the testimony of antient evidences, that the university was exclusively possessed of all ecclesiastical and spiritual jurisdiction over its own scholars.

Queen Elizabeth, in the third year of her reign, granted an extensive charter to this university; and by an act of parliament, 13 Eliz. c. 29 (for the incorporation of both the English universities), this and all preceding grants were confirmed, and the university of Cambridge was declared to be incorporated by the name of the Chancellor, Masters, and Scholars. The office of Chancellor, as chief magistrate of the university, had existed from a very early date: it was only annual till 1504, when Bishop Fisher was chosen chancellor for life: at present the office is biennial, or tenable for such a length of time beyond two years as the tacit consent of the university may allow. The other principal officers are, the High Steward, the Vice-chancellor, a Commissary, who holds a court of record for all privileged persons under the degree of M.A., a Public Orator, an Assessor, to assist the vice-chancellor in his court, two Proctors, whose business it is to regulate the discipline and preserve the peace of the university, a Librarian, a Registrary, two Taxors, who regulate the market, examine the assize of bread, and inspect the weights and measures, two Moderators, who superintend the exercises in the schools and the examinations for degrees in Arts, two Scrutators, who regulate the business of the congregations, two Proproctors, three Esquire-bedels, and some inferior persons.

The following are the colleges of this university, with the dates of their respective foundations:—Peter-House, 1257; Clare Hall, 1326; Pembroke College, 1343; Gonville and Caius, 1348; Trinity Hall, 1350; Corpus Christi, or Benet, 1351; King's, 1441; Queen's, 1446; Catharine Hall, 1475; Jesus, 1496; Christ's, 1505; St. John's, 1511; Magdalen, 1519; Trinity, 1546; Emmanuel, 1584; Sidney Sussex, 1598; Downing, 1800. [PETER-HOUSE, &c.]

The other public buildings belonging to the university are the senate-house, the library and schools, the botanic garden, the Pitt press, and the observatory. The senate-house, an edifice of the Corinthian order, was erected in 1722, from a design of Sir James Burrell. The schools were erected in 1443, at the expense of the university, assisted by liberal benefactions. The botanic garden occupies three or four acres: the ground, with a large and antient edifice, formerly belonged to the Augustine Friars; it was purchased by the late Dr. Richard Walker, vice-master of Trinity college, for 1600*l.* The old schools still remain, and belong to the Jacksonian professor for the time being; and a new building has been erected for the use of the lecturers in chemistry, botany, and anatomy. The Pitt press, or printing-house, was begun in 1831 and finished in 1833. The observatory was erected between 1822 and 1824, after the designs of Mr. J. C. Mead, at an expense of upwards of 18,115*l.*

The infirmary, called Addenbrooke's Hospital, was originally founded under the will of Dr. John Addenbrooke, the building of which was begun in 1753, but upon its completion in 1766, the funds being found insufficient for its support, an act of parliament passed to make it a general hospital. It has been since supported by voluntary contributions. The building was considerably enlarged a few years ago, under a bequest of Mr. Bowtell.

Richard Viscount Fitzwilliam, who died in 1816, bequeathed to the university his collection of books, paintings, drawings, &c., with the interest of 100,000*l.* South Sea annuities for the erection and endowment of a museum. This collection, called the Fitzwilliam Museum, is at present placed in the old free-school behind Corpus Christi college. Another museum, consisting chiefly of a collection of pictures, was bequeathed to the university by the late Mr. Mesman: they are for the present suspended in an apartment at the Pitt press.

Each college is a lay corporate body, bound by its own statutes; but the members of each college are also subject to the general laws of the university. The present university statutes were given by Queen Elizabeth in the 12th year of her reign, and are the foundation upon which all new laws are framed. Each of the seventeen colleges furnishes members both for the executive and legislative branch of university government. The place of assembly is the senate-house. All persons who are masters of arts, or doctors in one of the three faculties, viz. divinity, the civil law, or physic, having their names upon the college boards, holding any university office, or being resident in the town of Cambridge, have votes in this assembly. The senate is divided into two houses, denominated the Regent and the Non-Regent House: the former consisting of the doctors of less than two and the M. A.'s under five years standing; the latter, of the M. A.'s above five years. The doctors of more than two year's standing vote in either house at pleasure. There is also a council called the Caput, chosen annually on the 12th of October, by which every university grace or proposition must be approved before it can be introduced to the senate. The caput consists of the vice-chancellor, a doctor in each of the faculties, and two masters of arts, who are the representatives of the regent and non-regent houses. Any single member of the Caput has the power of putting a veto upon any grace that is proposed.

The annual income of the university arises from various sources. The rectory of Burwell and a farm at Barton produce about 1000*l.* per annum; the produce of fees at matriculations, for degrees, &c., and the

the university press, chiefly resulting from its share of the monopoly of printing Bibles, are supposed to average each about 2000*l*. The whole income from every source is believed scarcely to exceed 5500*l*. per annum. The funds are managed by the vice-chancellor, or by specific trustees; and the accounts are examined annually by three auditors appointed by the senate.

The public professors of the university are paid from various sources; some from the university chest, others from his majesty's government, or from estates left for that purpose. They are the Lady Margaret's Professor of Divinity; the Regius Professors of Divinity, Civil Law, Physic, Hebrew, and Greek; two Professors of Arabic, one of whom is called the Lord Almoner's Reader; the Lucasian Professor of Mathematics: Professors of Casuistry; Chemistry; Experimental Philosophy; Anatomy; Modern History; Botany; Geology; Astronomy; the Norrisian Professor of Divinity; Natural and Experimental Philosophy; the Downing Professors of the Laws of England, and of Medicine; the Professors of Mineralogy, Political Economy, and Music; besides which there are various endowed Lectureships. The Cambridge Philosophical Society was established in 1819, and incorporated by a Royal Charter dated 3rd August, 1832. It includes most of the resident graduates of the university.

The privilege of sending two representatives to parliament was conferred upon the university by charter, in the 1st of James I. The right of election is vested in the members of the senate, in number about 1900. The vice-chancellor is the returning officer.

(Gough's edit. of Camden's *Britannia;* Lysons's *Magna Britannia*, ut supra; Dyer's *History of the University and Colleges of Cambridge;* and the *Cambridge University Calendar;* to which last work the reader is referred for more particular information on the existing state of the university, its scholarships, degrees, prizes, &c.)

CAMBRIDGE, a town in Middlesex county, in the State of Massachusetts, about three miles W.N.W. of Boston, with which it is connected by the west Boston bridge and canal bridge across Charles River.

When founded by the New England settlers, this place received the name of New Town, but after the establishment of Harvard College the name was changed to that which it now bears, in compliment to the English University of Cambridge. The population of the town, according to the census of 1820, was 3295: in 1830 it had increased to 6071.

Harvard College, now styled Harvard University, was founded in 1636 with funds, to a very limited amount, advanced by the province; it was incorporated in 1638, and in the same year received a bequest of about 800*l*. from the Rev. John Harvard, on which account the institution was named Harvard College. Its endowments have since been greatly increased by donations from the public funds of the state, and by many private contributions, so that it has become the most richly-endowed place of education in the United States. Its property, according to the treasurer's report in October, 1832, amounted to 395,689 dollars: its annual income during the same year was 40,962; and the expenditure 41,054 dollars. Rather more than one-half of the income was derived from payments made by the students.

The university comprises the collegiate department, and the departments of divinity, law, and medicine. It contains four halls, each four stories in height, which are set apart for the accommodation of the under-graduates. There are besides two halls, containing the library, cabinet of minerals, chapel, and various other public rooms; a divinity hall, a law hall, and other buildings. The medical hall belonging to the university is situated in Boston. The number of under-graduates in 1833 was 212; of theological students, 31; of law students, 50; and of medical students, 82—making together 375 students. The whole number of alumni then amounted to 5863, of whom 2265 were living. The library contains above 40,000 volumes: 35,500 are in the general library; 3000 are in the law library; 1000 in the medical, and 650 in the theological library. The medical library, said to contain 4000 volumes, is in Boston. There is also a library belonging to the students, which contains 4500 volumes. The institution possesses valuable chemical and philosophical apparatus, and an extensive cabinet of minerals. There is also an excellent anatomical museum, and a botanic garden, comprising seven acres of land. The university is governed by a corporation, consisting of seven members, one of whom must be the president of the university, and a board of overseers, composed of thirty elected members, in addition to the governor, the lieutenant-governor, the members of the State Council and Senate, and the speaker of the House of Representatives, all of whom are members of the board of overseers *ex officio*. The teaching body consists of the president, 21 professors, 2 tutors, and various assistants. The immediate government is in the hands of the president, part of the professors, and the tutors.

The first printing executed in British America was performed at Cambridge in 1639, with an apparatus sent from England in the preceding year by the Rev. J. Glover, a dissenting minister. The first thing printed was 'The Freeman's Oath;' the second was an almanac. The first book that issued from the Cambridge press was a version of the Psalms in metre, printed in 1640. In 1663 an edition of the Bible, translated into the Indian language, was printed. Cambridge was for thirty-five years the only place in New England in which printing was carried on. In 1834 the town had five monthly and two quarterly literary journals.

The town contained, in 1833, three joint stock banks, with capitals amounting in the aggregate to 400,000 dollars.

CAMBRIDGE MANUSCRIPT. [BEZA'S MANUSCRIPT.]

CAMBRIDGESHIRE, an inland county of England, lying between 52° 1′ and 52° 45′ N. lat., and 0° 31′ E. and 0° 15′ or 0° 16′ W. long. It is of an irregular oblong form, having its greatest length about 51 miles, measured N. by W. and S. by E. from Tyd St. Giles, near Wisbeach, to Castle Camps, near Linton; and its greatest breadth 32 miles, from Gamlingay, near the border of Bedfordshire and Huntingdonshire, to Ashley, near Newmarket. It is bounded on the N. by Lincolnshire; on the E. by Norfolk and Suffolk; on the S. by Hertfordshire and Essex; and on the W. by Bedfordshire, Huntingdonshire, and Northamptonshire. Cambridge, the county town, is 48 or 49 miles in a direct line N. by E. from London, or 50½ miles by the road through Ware, Buntingford, and Royston, or 56 miles by Epping, Stanstead, Newport, and Great Chesterford. The superficial measurement of the county is 584,460 acres, or 857 square miles; and the population in 1831 was 143,955, or about 168 to a square mile.

Surface, Hydrography, and Communications.—The whole northern part of the county and a considerable part of the centre are comprehended in the vast tract of fen-land known as the Bedford Level. The inclosures in this part are chiefly formed by ditches, and the country presents few trees except pollard willows. The towns and villages are on spots which rise above the general level of the fens, and the churches crowning these slight elevations may be distinguished at a considerable distance. To these insulated eminences the designation of *ey* (island) appears to have been applied; and hence Thorn-ey, Whittles-ey, Rams-ey (Huntingdonshire), and other places, derive part of their name. The designation of 'the Isle of Ely' was at first restricted to the insulated eminence on which Ely stands, though it has now a much more extended signification. The southern part of the county has gently-rising hills, with some wood in the parts bordering on Suffolk, but little in other places. The Gogmagog hills, S.E. of Cambridge, are the highest in the county. Coach and Horses hill, or Orwel hill, S.W. of Cambridge, is about 302 feet above the level of the sea; and Madingley hill, W. of that town, 238 feet.

The chief rivers of the county are the Nene and the Ouse, with its tributaries, the Cam, Lark, &c.

The Nene has only the lower part of its course in this county, the border of which it touches just below Peterborough, where it is divided, and flows in three channels. One arm, under the name of Catswater and the Shire Drain, winds to the N.E., and forms the boundary between Cambridgeshire on the one hand and Northamptonshire and Lincolnshire on the other. Another arm, under the names of Whittlesey Dyke* and the Well Creek (or the Old Nene River) passes to the E. by Whittlesey and March, and joins the Ouse at Salter's Lode Sluice. The third arm (Morton's Leam) proceeds in a tolerably direct line E.N.E. to Wisbeach, and from thence N. into the Wash. The Shire Drain joins this just at its outfall. The natural channel of the river can now hardly be distinguished, so much has the river become connected with the immense system of artificial drainage and navigation carried on in this part of the country.

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* This dyke is a cut, saving the very circuitous navigation through Whittlesea, Ramsey, and Ugg Meres, through which this arm of the Nene passed.

The Ouse first joins this county below St. Ives, and winds N.E. to the Hermitage Sluice, dividing Huntingdonshire from Cambridgeshire. At Hermitage Sluice the river, in its natural course, turns to the S.E., and again gradually to the N.E., receiving the river Cam. It then passes the city of Ely, below which it is joined by the Lark. From the junction of the Lark it flows N.E. for a few miles, receiving the Little Ouse from Thetford and Brandon; at [illegible] it leaves Cambridgeshire and enters Norfolk, in which county it flows northward till it enters the Wash below Lynn. The original course of the Ouse below Littleport, near the junction of the Lark, is supposed to have been very different from the present course. From Hermitage Sluice a navigable cut, called the New Bedford River, runs N.E. in a direct line across Cambridgeshire into Norfolk, after entering which it joins the Ouse at Denver Sluice, where the Old Nene River also joins the Ouse. The natural channel between Hermitage and Denver Sluice is now only navigable, or at least is only used for navigation, so far as is requisite for the navigation of its tributary streams, the Cam and the Lark. A canal from Wisbeach to the Old Nene River connects the navigation of the Nene and the Ouse.

The measurements of these rivers are about as follows:—Nene, 1st arm (Catwater and Shire Drain), to its outfall, about 28 to 30 miles; 2nd arm (Old Nene), to its junction with the Ouse, about 28 miles, of which 23 are in Cambridgeshire or on the border; 3rd arm, or Morton's Leam and Wisbeach River, from Standground Sluice to Wisbeach, 19 miles; from Wisbeach to the Wash, 6 miles; Nene Outfall, through the sands of the Wash, 8 miles (6½ cut and a further channel of 1½ miles worked by the river itself): total, 33 miles. Ouse, on the border of the county to Hermitage Sluice near Bluntisham, 5 miles; to junction of Cam, 12; to Ely, 3; to junction of Lark, 3; to junction of Little Ouse, along the border of the county, 7: total, in or upon the border of Cambridgeshire, 30 miles. The remainder of the course of the river is as follows:—to the junction of the New Bedford River at Denver Sluice, 6 to 7 miles; to Lynn, 15; to the outfall, 3: total, 24 or 25 miles. The length of the New Bedford River between Hermitage and Denver Sluices is 21 miles, of which about 15 are in Cambridgeshire: the length of the natural channel of the Ouse between the same points is 31 or 32 miles.

The Cam, or Granta, is formed by the junction of several small streams which rise in Essex, the principal one of them between Saffron Walden and Dunmow. This flows N. to Audley End, near Saffron Walden, and thence by Great and Little Chesterford, Duxford, Whittlesford, Great and Little Shelford, and Granchester, to Cambridge, receiving the Linton, from the town of Linton, above the Shelfords, and the Rhee and Bourn from the S.W. and W., above Granchester. From Cambridge, where the navigation commences, the Cam runs N.N.E. and falls into the Ouse about 3 miles above Ely: length, above Cambridge, about 25 miles, of which half are in this county; from Cambridge to the junction with the Ouse, 15 miles.

The Lark, navigable as far as Bury St. Edmunds, properly belongs to Suffolk. It separates that county from Cambridgeshire for about 7 miles before its junction with the Ouse: and the Kennet brook, a feeder of the Lark, forms the boundary between these two counties about 7 miles before it falls into the Lark.

The canals of these counties are not numerous, except those connected with the fen district, the principal of which have been already noticed. [BEDFORD LEVEL.] There is a canal from the neighbourhood of Ramsey, Huntingdonshire, called the Forty Foot, or Vermuiden's Drain, to the Old Bedford River, which is a cut now scarcely used for navigation, parallel to the New Bedford River. There are navigable cuts from the Ouse to Soham and Reche, and a canal running nearly N. and S. (the London and Cambridge Junction Canal) connecting the Cam below Cambridge with the Stort (at Bishop Stortford) and the Lea, and ultimately with the Thames. There is a branch from this canal at Great Shelford to Whaddon, between Royston and Huntingdon.

The chief roads are those from London to York and Edinburgh (the Great North Road), to Norwich by Newmarket, and to Cambridge; from Cambridge to Huntingdon, Newmarket, and Lynn; and from the Great North Road by St. Ives to Wisbeach.

The Great North Road enters the county at Royston, 37½ miles from town, and traverses it in a direction about N. by W., without passing through any market-town until it enters Huntingdonshire, between [illegible] and 53 miles from town. The road from London to Cambridge through Royston turns off from the Great North Road at Royston and runs N.E. to Cambridge about 13 miles. Another road to Cambridge, branching off from the Great North Road at Puckeridge in Herts, enters Cambridgeshire near Fulmere or Foul [illegible] and unites with the road through Royston at Hawkston, about 5 miles short of Cambridge.

The Norwich and Newmarket Road enters the county just beyond the village of Great Chesterford, about 46 miles from London, and runs N.E. to Newmarket, and finally quits the county to enter Suffolk about 5 miles beyond Newmarket and 66 from London. A third road to Cambridge branches off from this road just before it enters the county, and runs N. by W. about 10½ miles.

The road from Cambridge to Huntingdon runs N.W. about 15½ miles, of which about 10 are in Cambridgeshire; for the last mile it coincides with the Great North Road, which meets it at Godmanchester. The road from Cambridge to Newmarket runs E. by N. 13 miles, uniting with the Norwich and Newmarket Road about 2 miles from the latter town. The road from Cambridge to Lynn runs N. by E. through Ely, and quits the county at Littleport Bridge, 22 miles from Cambridge.

The N. part of the county is traversed by a road which branches off from the high North Road just where this leaves Cambridgeshire to enter Huntingdonshire, and running N.N.E. through St. Ives, re-enters Cambridgeshire at Chatteris Ferry, 70 miles from London, and runs 21 miles through March to Wisbeach, from whence it runs farther N. into Lincolnshire, to Holbeach, Spalding, and Boston.

A road runs from Cambridge over the Gogmagog Hills to Linton, and thence into Suffolk and Essex to Haverhill, Halsted, and Colchester; and there are two turnpike-roads from Ely, one to Soham in the direction of Newmarket and Bury St. Edmunds, and one to Chatteris, where it meets the road from St. Ives to Wisbeach.

Geological character.—The south and south-eastern parts of the county are occupied by part of the great chalk formation which extends, within the limits of Cambridgeshire, from Newmarket heath to Royston: it forms the mass of the Gogmagog hills, S.E. of Cambridge, and of the Royston downs, which are connected with the Luton and Dunstable downs (Bedfordshire), and by them with the Chiltern hills (Bucks.). There are also in Cambridgeshire two masses of this chalk detached from the principal mass,—the Coach and Horses hill, near Orwel, S.W. of Cambridge, and Madingley hill, W. of Cambridge. The chalk of Cambridgeshire consists of two varieties, the upper containing an abundance of the common black flint, and the lower or grey chalk, which contains little or none. The upper is found in the S.E. part of the county: the lower chalk forms the principal hills, and occupies the N.W. part of the chalk range. The chalk is furrowed transversely by the depression through which the London and Cambridge canal passes, and which separates the Gogmagog hills from the Royston downs. The district N.E. and E. of Cambridge is the most level chalk district in England; its flatness alone gives importance to the otherwise inconsiderable eminences of the Gogmagog hills. The chalk district of Cambridgeshire dips gently to the S.E.

The diluvial beds of loam, mixed with fragments of chalk, which overspread the upper part of the basin of the Stour in Essex and Suffolk, covering the chalk, extend a short distance into the adjacent parts of Cambridgeshire.

The chalk rests upon a blue clay, called in the county *galt*, which is considered as a variety of the chalk-marl formation that crops out from beneath the north-western boundary of the chalk. This formation occupies a greater extent of surface than it usually does, extending to the boundary of Huntingdonshire and Bedfordshire; its thickness is variable, averaging perhaps 200 or 220 feet. It is nearly impervious to water.

In a few places along the irregular line which separates this county from the two just mentioned, the iron-sand, which underlies the galt, rises to the surface. It forms excellent garden ground. Throughout the whole of this formation many fragments of mineralized wood are found; when dry they crumble into a fine powder, but when moist and fresh from the earth are definite in form, and have the bark in the utmost state of preservation. (Conybeare and Phillips's *Outlines of the Geology of England and Wales*;

Geol. Trans., vol. v.; *Greenough's Geological Map of England*, &c.)

The whole of the northern part of the county is overspread with the fens [Bedford Level]; the greater part of which in this county are comprehended in the Isle of Ely. At a former period this designation was confined to the higher ground round Ely, which rose out of the marshes, and was surrounded by them; but the application of the name has been much extended. The marshes S. of the Old Ouse, about Soham, Wicken, and Reche, are not included in the Isle.

Agriculture, &c.—The soil of this county is extremely various, consisting of clay, loam, and chalk, both in the uplands and the fens. Although there are some poor commons and heaths, the greater part of the land is fertile. In some spots called white land, which have chalky subsoils, great crops of wheat and beans are raised. The Burwell wheat is in great request for seed in many parts of England, and the cheeses of Cottenham indicate considerable richness in the pastures. The climate in the uplands is mild and healthy, but in the fens, especially those which have not been thoroughly drained, agues and fevers prevail when the water has evaporated and left the land in a half dry state. When the land is quite flooded the air is less impregnated with unhealthy effluvia. In proportion as the fens are drained and the land is cultivated, the air becomes more healthy.

The upland district is sufficiently varied to afford good situations for residences; but until the beginning of this century a very small proportion of the land was inclosed. Above three-fourths of the surface was occupied by commons, common-fields, heaths, and fens. Of these many have been inclosed within the last thirty years; and in the course of time the whole face of the country will be much improved by the growth of trees and hedge-rows. There are few counties where so many inclosures have taken place under special acts of Parliament. The villages were mostly situated in hollows, between gentle elevations, where the soil was naturally most fertile, and being scattered through an open country, with their small inclosures and orchards, presented insulated green spots, which formed a strong contrast with the surrounding open fields entirely destitute of trees. The fen district is a dead flat intersected with ditches, canals, and sluggish streams. The soil consists of mud mixed with decayed and half-decayed vegetable matter. When the superfluous water has been removed, a soft spongy surface is left, which is much improved by burning. The ashes thus produced by being mixed with the soil greatly enrich it, and the most luxuriant crops are obtained without any other preparation. When a judicious rotation is adopted, and the ground is not too much exhausted to be restored by proper manures, this land, which is reclaimed from a state of comparative unproductiveness, becomes very valuable. But the temptation of immediate profit frequently induces the farmer to raise exhausting crops from it, as long as they will grow without fresh manuring, by which means the soil is so impoverished, and its *staple** so reduced, that subsequent tillage or manuring cannot recruit it for a very long time.

The first operation on a newly-inclosed fen, when it has been drained, is to pare the surface, on which coarse grass and sedge are growing in a matted state. The sods are cut about three inches in thickness and of various lengths and breadths, by means of a paring plough. This is a sharp instrument drawn by two horses, which cuts horizontally under the surface, and is guided by two handles like a plough. The sods being set on edge to dry partially are then arranged in the form of a small kiln with proper air-vents, and lighted by means of brush-wood or straw. As soon as they begin to flame more sods are added, and the fire is prevented from breaking out by immediately covering with a sod every place from which the smoke issues strongly. In a short time a great quantity of sods is reduced to a carbonized mass, which, when cool, is spread over the ground. This is immediately ploughed in, and the land is sown with cole-seed or rape, of which an abundant crop is invariably produced. The cole is fed off with sheep, the land ploughed once, and oats are sown, which produce astonishing crops. This is succeeded by wheat, or sometimes by another crop of oats, in which are sown clover and grass seeds, which soon cover the ground with fine herbage. The land is left in grass as long as the grass is good. As soon as it begins to decline in quality or produce, it is ploughed up and sown with oats, or it is again pared and burnt as The most common practice however, when the soil is very rich, is to take crops of cole-seed, wheat, barley, and oats, and not to sow grass seeds till after several crops have been obtain taking care however to keep the land clean. Th newly-drained fens is very loose, and requires to pressed after the seed is sown. This is sometimes done men treading the ground with their feet, or by driving sheep over it; but the land-presser [Arable Land, vol. ii., p. 225] is particularly adapted to this purpose. It not only consolidates the land, but forms drills for the reception of the seed. The grasses usually sown with the last crop of barley or oats are, of rye-grass two bushels and of white clover ten pounds. Where the land is cultivated with care the use of rape-cake as manure is common. It has the advantage of being readily brought from a distance: 1000 cakes weigh about a ton, and are sufficient for three acres. The rape-cake is ground to a powder, which is drilled with the seed by a machine. It ensures a crop of corn on land which has been exhausted, and in this way it is a matter of simple calculation whether it repays the expense. But the most advantageous mode of using it is to sow it with cole or turnip-seed, and to feed off the crop with sheep; permanent improvement of the soil is thus produced, and the land is recruited for several crops.

Besides corn and hay, the fens, where they have not been brought into cultivation, produce turf for fuel, and reeds and sedges for thatching and lighting fires. An acre of ground will produce 300,000 turves, 5000 of which are considered to be equal to forty bushels of coals. The price varies from 6*s.* to 10*s.* per thousand, according to the situation and comparative price of coals. Osier beds are likewise formed in some places, and give a good return.

In the uplands towards Hertfordshire and Suffolk, the land was formerly cultivated on the old three-field system, and there are still farms where a summer fallow is regularly succeeded by wheat or barley, and that by oats, with the occasional introduction of clover or beans. But where a better system has been adopted after the inclosure of the common fields, turnips form the foundation of the course on all lands which are sufficiently dry to allow sheep to be penned on them. On some stiff clays, cabbages have been introduced, and cultivated to some extent. The large red cabbage is preferred by many to the drum-head, because it is not so liable to be attacked by caterpillars. They manure the land for this crop with twenty or thirty good loads of farm-yard dung per acre, and find the produce very valuable for cattle and sheep in winter. In the rich white land, wheat and beans are sown alternately, as long as the land is clean: and if the beans are drilled and well hoed, and the land moderately manured for this crop, this simple and profitable rotation may go on for a considerable time.

By the introduction of sainfoin on some of the thin chalky lands, a soil naturally very unproductive now supports a great quantity of cattle and sheep, and also bears good crops of corn after having been some years in grass.

There is a great portion of the stiff heavy lands in Cambridgeshire, independently of the fens, which would be greatly benefitted by judicious surface-draining. By this means, many soils now too wet to bear turnips, or to allow heavy cattle to be depastured upon them in spring or autumn, would become dry and sound; and the water being carried off by the drains, would not stagnate below the surface and keep the ground in a soft state, equally prejudicial to the growth of all plants not usually found in marshes, and to the cattle and sheep depastured on them. A convertible husbandry might then be introduced, the expenses of cultivation much diminished, and the produce greatly increased.

The fairs in Cambridgeshire are not so numerous as in many other counties. The principal cattle-fairs are in the Isle of Ely. Cambridge fair begins June 24th, and lasts a week. Ely; Holy Thursday, and October 29th. Linton; Holy Thursday, and September 30th. March, Isle of Ely; Monday before Whit-Sunday, and Whit-Monday. Soham; April 28th. Sturbitch fair begins September 18th, and lasts 14 days. It was once one of the greatest trading fairs in England: it is now greatly fallen off. Thorney, Isle of Ely, July 1st, ember 21st. Whittlesey, Isle of Ely, January 25th, Jun th, and October 26th. Wisbeach, Isle of Ely, Wednesday before Whit-Sunday, July 25th.

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* The staple of a soil is a peculiar quality, on which depends its power of nourishing the roots of plants and conveying to them those particles on which their growth and health depend.

Divisions, towns, &c.—The divisions of Cambridgeshire have undergone little change since the Domesday survey. We subjoin a list of the present hundreds, giving also their situation in the county, and their antient names.

Wisbeach, Witchford, Ely, occupy the northern half of the county, and correspond to the two antient hundreds of Ely. Staploe (E.)—Staplehou. Cheveley (E.)—Chavelai. Radfield (S.E.)—Radefelle. Chilford (S.E.)—Cilde- [illegible] ittlesford (S.)—Witelesfeld. Triplow (S.)—Tre- [illegible] Armingford (S.W.)—Erningford. Stow, or Long [illegible] (S.W.)—Stou. Papworth (W.)—Papeword. North Stow (central)—Norestou. Chesterton (central)—Cestretone. Wetherly (central)—Wederlai. Flendish (central) Flamindic, or Flamidinc. Staine (central)—Stanes.

The county itself is called in Domesday Grentebrigescire. In that survey the town of Cambridge is taxed as a hundred.

Besides the county town, Cambridge (on the Cam, population in 1831, 20,917), this county has one city, Ely (on the old Ouse, population in 1831, 6[illegible]); and four market towns, Wisbeach (on the Nene, population in 1831, 7253), March (on the old river Nene, population in 1831, 5117), Thorney (population in 1831, 2055), and Linton (on the Linton, a small stream flowing into the Cam, population in 1831, 1678). Several other places formerly had markets: of these the market at Soham (population, in 1831, 3667) has been disused about 130 years; that at Whittlesey (population in 1831, 6019) not more than 50: these seem to have been both held by prescription. For Cambridge, Ely, March, and Wisbeach, we refer to their respective articles. The other towns, with Soham and Whittlesey, we shall notice here.

Newmarket is chiefly in Suffolk, and Royston chiefly in Herts.

Thorney is a small town (in Witchford hundred, 39 miles from Cambridge) on a slight eminence rising out of the midst of the fens. Here was antiently a monastery or hermitage, said to have been founded by Saxulph, first abbot of Medeshamsted or Peterborough; and here, in the year 870, were a prior and several anchorites. The monastery was called Ancarig, but the spot on which it stood had the name of Thorn-ey, from the thickets with which it abounded. 'Thorneie propter condensitatem dumorum vocata. Gul. Malmesb. *de gestis Pontif.*, in Dugdale's *Monasticon*. In 972, this establishment, which had been destroyed by the Danes, was refounded by Ethelwold, bishop of Winchester, for Benedictine monks. Its revenue, at the time of the Domesday Survey, appears to have arisen from rents, amounting to 52*l.* 15*s.*, and from the profits of some fisheries and meres in Huntingdonshire. William of Malmesbury (quoted above), who lived in the reign of Henry II., speaks enthusiastically of the natural beauty of the situation and of the holiness of the inhabitants: he speaks with rapture of the trees, apple orchards, and vineyards. The abbot was mitred. The revenues, at the suppression, were 508*l.* 12*s.* 5*d.* gross (Speed), or 411*l.* 12*s.* 11*d.* clear (Dugdale). The possessions and site were granted to the then earl of Bedford, whose heir, the present duke of Bedford, is proprietor of the whole parish and lord of the manor. There was also an hospital for poor persons under the government of the abbey.

A part of the conventual church, rebuilt in 1085 and 1125, is yet standing, and serves as the parish church. The part which remains is the nave of the church; the aisles have been destroyed, and the arches, five in number, walled up. The west end is a fine specimen of architecture, though in a very mixed style, being flanked with Norman square turrets, crowned with octagonal perpendicular tops; the doorway has deep mouldings and niches; and the whole of this front has an imposing appearance.

Thorney has a small weekly market on Tuesday, chiefly for butcher's meat; and three annual fairs, two of them much frequented for the sale of horses and cattle. Population, in 1831, 2055, chiefly agricultural. The living is a donative, exempt from episcopal jurisdiction, and in the gift of the duke of Bedford; income, in 1831, 220*l.* There is a school-house, built by an ancestor of the duke of Bedford, who allows the master 20*l.* per annum: the duke also supports ten or twelve poor families in some almshouses, which have no permanent endowment. A colony of French and Walloon refugees were settled here about the middle of the seventeenth century, and employed by the then earl of Bedford in draining the fens. Several of these refugees have tombs in the churchyard, and many of the inhabitants are descended from them.

In Gorton's *Top. Diction.*, mention is [illegible] a literary society established here in 1823, and [illegible] a good library.

Linton, in Chilford hundred, 11 miles from Cambridge, is a small town pleasantly situated. The houses are principally low and covered with thatch; a few are of brick. There is a small market-house of mean appearance, and a spacious church. There were formerly two religious houses in this parish; one an alien priory subordin[illegible] the abbey of St. Jacutus de Insula, in Bretagne: th[illegible] other (at Barham) a priory of Crossed or Crouched fri[illegible] a cell to Welnetham, in Suffolk, which was itself subor[illegible] house of this order in London. The former was suppressed in the time of Henry VI., and its possessions given to the master and fellows of Pembroke H[illegible]bridge. There are some remains of the conventual buildings at Barham incorporated into Barham Hall, a country seat for the master of Pembroke Hall for the time being.

Linton has a weekly market, at which there is a good trade in corn: and two annual fairs, one a great sheep fair. Population, in 1831, 1678; about one-third of the adult males are engaged in agriculture. The living is a vicarage, in the diocese and archdeaconry of Ely, in the gift of the bishop of Ely; annual value, 204*l.*

Soham is in the hundred of Staploe, 5½ miles from Ely, on the road from that city to Bury St. Edmunds. It is a large, irregular place, with a spacious cross church, having a tower at the west end. St. Felix, the first bishop of the East Angles, is said to have founded a monastery here, and to have placed here (about A.D. 630) the episcopal see, afterwards removed to Dunwich. The monks of this convent were massacred by the Danes in 870, and the bishop's house and the church burnt. Before the draining of the fens, there was a large mere at Soham.

A good deal of cheese is made about Soham similar to the Stilton cheese. The population, in 1831, was 3667, chiefly agricultural. There is a navigable cut from the river Ouse to Soham. The living is a vicarage (with the curacy of Barway attached), in the archdeaconry of Sudbury and diocese of Norwich. The annual value is 1642*l.*; it is in the gift of Pembroke Hall, Cambridge. There is a large charity-school and several almshouses, with very small endowments. Although, on the authority of Messrs. Lysons, we have stated that the market is discontinued, some authorities speak of a market now held weekly on Saturday. There is an annual fair.

Whittlesey, in Witchford hundred, is 34 miles from Cambridge. It consists of two parishes (Whittlesey St. Mary and Whittlesey St. Andrew), and has two churches, but the respective bounds of the parishes are not known, and there is only one parochial register. The livings are in distinct patronage, and for some time were commonly held by the same person; at present there is a vicar to each. St. Andrew's church is the largest; St. Mary's church has a very fine tower and spire.

The market has been discontinued about 50 years. The population, in 1831, was 6019, chiefly agricultural. There is an annual fair.

There are two endowed charity-schools at Whittlesey, and some almshouses, the latter supported by the parish. At Eldernall in the parish is a ruined chapel. Whittlesey Mere is a large piece of water in Huntingdonshire, S.W. of the village. It yields abundance of fish. The livings of St. Mary and St. Andrew are vicarages in the diocese of Ely, exempt from visitation, and in the gift respectively of the earl of Waldegrave and of the crown. (See *Clerical Guide*, London, 1836.) The value of St. Mary is 222*l.*, and that of St. Andrew 62*l.* per annum.

Divisions for Ecclesiastical and Legal Purposes.—The county is, for the most part, in the diocese of Ely. A few parishes, which originally formed part of the [illegible]om of the East Angles, while the rest of Cambridgesh[illegible]onged to Mercia, are in that of Norwich, and one is a peculiar of the diocese of Rochester. There are 165 parishes, but some of these are, for ecclesiastical purposes, united, and several have dependent chapelries. Of the 165 parishes 62 are rectories, 81 vicarages, 22 curacies or donatives. Those parishes of the diocese of Ely which are in the hundreds of Ely, Wisbeach, and Witchford are mostly exempt from episcopal jurisdiction; the others are in the archdeaconry of Ely, the only archdeaconry in this see.

The bishop of Ely has considerable civil jurisdiction, and is Custos Rotulorum of the district subject to him, which is styled [illegible] Liberty or Franchise of the bishop of Ely,' or popularly the Isle of Ely, and includes the hundreds of Ely, Wisbeach, and Witchford. The bishop appoints a chief justice, who holds a session of pleas above 40*s.* under a commission from the bishop, and a session of oyer and terminer and gaol delivery by virtue of a commission from the king; a chief bailiff, who exercises the same functions in the Isle as the sheriff does in a county; a deputy bailiff, two coroners, and subordinate officers. The spring assizes for the Isle and the April and October sessions are held at Ely; the summer assizes and the other sessions at Wisbeach. The inhabitants of the Isle are exempt from paying county rates and from serving on county juries.

The [illegible] the county is in the Norfolk circuit. The assizes and quarter-sessions are held at Cambridge. The county returns three members to parliament (one having been added by the Reform Act), the borough of Cambridge two, and the university of Cambridge two. Cambridge is the chief place of county election, and the polling stations are Cambridge, Ely, Newmarket, Royston, Wisbeach, and Whittlesey. The number of voters, by the registration of 1836, was 3683, exclusive of the Isle of Ely, which has 3027: total 6710.

History and Antiquities.—In the most remote period of British history Cambridgeshire appears to have been inhabited by the Iceni, a powerful nation, whose territory comprehended also the counties of Norfolk and Suffolk, but Cambridgeshire does not appear to have been the scene of any remarkable event in their history. In the Roman division of the island this county was included in Flavia Cæsariensis.

Several British and Roman roads crossed this county. Ikeneld and Ermine Streets are supposed to be British. Ikeneld or Icknield Street crosses the county from the neighbourhood of Newmarket to the neighbourhood of Royston. For a considerable part of this distance it runs parallel to the road from Newmarket to London and a little to the left of it. Just before it reaches the border of Essex it bends to the right and runs W., just within the boundary of the county, to Royston; from whence it gradually turns to the S.W. and runs towards Baldock (Herts). This antient road has been in some parts so far obliterated by the plough as not to be easily traceable, in other parts the marks of its course are evident. Ermine Street entered the county at Royston, and ran to the left of the present turnpike-road to Caxton and Godmanchester near Huntingdon. A Roman road in the same direction kept nearly in the line of the present turnpike-road. The great Roman road (Via Devana) which connected the colonies of Camulodunum (Colchester or Maldon) and Deva (Chester) passed through Cambridgeshire, entering the county from Withersfield, near Haverhill in Suffolk, and proceeding with little deviation from a straight line to Cambridge, where it is supposed the Romans had a bridge, and from thence nearly in the line of the present turnpike-road to Godmanchester near Huntingdon. Another road entering near Littleport crossed the county through the fens near Ely to Cambridge, and from thence towards Sandy or Salndy, in Bedfordshire, and Fenny Stratford, in Bucks. Another road may be unperfectly traced running near Newmarket and Soham through the fens to Ely; and Sir W. Dugdale mentions one across the fens from the neighbourhood of Downham (Norfolk) to Whittlesey and Peterborough (Northamptonshire); and it has been conjectured that a branch from this led by Elme and Wisbeach into Lincolnshire. Cambridge is considered to have been a Roman station, probably the Camboricum of the Itineraries, called by Richard of Cirencester a colony, though the distances given in the Itineraries of Antoninus and Richard do by no means suit, but these have been probably corrupted. Roman antiquities of various kinds have been dug up at Cambridge, Soham, Elme, near Wisbeach, and other places.

The circular camp of Vandlebury on the Gogmagog Hills, Arbury in the parish of Chesterton near Cambridge, Willingham on the edge of the fen, and the earth-works round the sites of Bourn and Camps Castles, are probably of British origin. There is a considerable round mound near Cambridge Castle, like Silbury hill, but less: the ditches round it may be Roman. Vandlebury, from Roman remains found there, appears to have been afterwards occupied by the Romans; and Willingham was occupied and strengthened with new works by William the Conqueror when he besieged the Isle of Ely. There are the remains of a Roman camp at Great Shelford near Cambridge; and a Roman embankment, connected with the works for draining the fens, extends some miles from Elme to Tyd St. Giles near Wisbeach.

There are some very remarkable antient ditches in this county: as the Devil's Ditch near Newmarket, running N.W. and S.E. for about four or five miles, and crossing the London Road; Fleamdyke, running parallel to it at a distance of six miles; a third near Bourn Bridge, not far from Linton; and a fourth (slighter work) near [illegible]mire, nearly in the same direction as the first two. The Devil's Ditch, the largest probably, and the most perfect, consists of a deep ditch and an elevated vallum, having a slope of 52 feet on the S.W. side, where the ditch is, and 26 feet on the N.E. side; the whole of the works are about 100 feet in breadth.

In the wars between the Saxons and Danes this county suffered severely. About A.D. 870 Cambridge was burnt by the Danish invaders; the monasteries of Ely, Soham, and Thorney were destroyed, and their inmates slaughtered. The first attack of the barbarians on the isle of Ely was repulsed, but the second was successful; many of the Saxon nobles who had taken refuge there with their effects became the prey of the invaders. In 875, in the reign of Alfred, the larger portion of the Danish army was posted at Cambridge, which had been rebuilt. In 921 an army formed of those Danes settled in East Anglia by Alfred, surrendered at Cambridge to Edward the Elder. In 1010 Cambridge was again burnt by the Danes, who were ravaging the country under their king Svein.

When William the Conqueror invaded England, the most obstinate resistance which he experienced was in the Isle of Ely. Hereward le Wake, son of Leofric, lord of Brunne (Bourne?) in Lincolnshire, had been banished in early life for his violent temper, and having signalized his valour in foreign parts, was in Flanders when the battle of Hastings was fought in 1066. Hearing that his paternal inheritance had been given to a Norman, and his mother ill used, he returned to England, and commenced hostilities against the usurpers of his patrimony. The isle of Ely was his central station, and he built on it a wooden castle which long retained his name. William surrounded the island with his fleet and army, attempting to make a passage through the fens by solid roads in some parts and bridges in others; and either awed by the superstition of the times, or wishing to make it subservient to his interests, he got a witch to march at the head of his army and try the effect of her incantations against Hereward. The Anglo-Saxon, no way daunted, set fire to the reeds and other vegetation of the fens, and the witch and the troops who followed her perished in the flames. The actions of Hereward became the theme of popular songs, and the Conqueror's own secretary, Ingulphus, has penned his eulogium. During his warfare against the Normans his camp was the refuge of the friends of Saxon independence: Morcar earl of Northumbria, Stigand archbishop of Canterbury, Ellgwin bishop of Durham, and others, repaired to him. The defence of the Isle lasted till 1074, and the Conqueror penetrated at last only by virtue of a compact with the monks of Ely, whose lands beyond the island he had seized. Hereward, unsubdued, contrived to make his peace with the king, obtained the restoration of his inheritance, and died quietly in his bed.

In the civil wars of Stephen and the Empress Maud, the bishop of Ely, who supported the latter, built a wooden castle at Ely, and fortified the castle of Aldreth (in Haddenham parish), which appears to have commanded one of the approaches to the Isle. The king attacked the Isle and took the castle of Aldreth, but it was afterwards retaken (about the year 1142) by the bishop. The Isle afterwards suffered much from the ravages of war, and from famine and pestilence, the consequence of these hostilities. In the civil war between John and his barons the isle was twice ravaged by the king's troops, first under Walter de Buuck, and afterwards under Fulk de Brent (the king's favourite, who had been appointed governor of Cambridge Castle) and his confederates. This was about the year 1216. About the same time the barons took Cambridge Castle, and the king marching into Cambridgeshire did, as Holinshed expresses it, 'hurt enough;' but on the king's retreat the barons recovered the Isle of Ely except one castle, probably that at Ely. In the troubles which marked the close of the reign of Henry III. the Isle was again the scene of contest. It was taken and fortified by the barons, who ravaged the county and took and plundered Cambridge. The Isle was retaken by the king's son, afterwards Edward I., in 1266 and following years.

In the civil war of Charles I. the county of Cambridge was one of those associated for the support of the parliament: the king had no visible party in it, and not one fixed post. The University was indeed loyal, and the heads of it voted their plate to be melted down for the king's use. In 1643 Cromwell took possession of Cambridge, and the earl of Manchester being sent down, expelled the most eminent loyalists from the University: in 1645 Cromwell was again sent to secure the Isle of Ely. When the king was seized by Cornet Joyce in 1647 the parliamentary army was at Kennet, in this county, near Newmarket; but the king was conveyed by Cromwell's order to Childerley, near Cambridge, where Cromwell and Fairfax visited him. On the 9th of June in the same year the king was removed to Newmarket.

Of baronial castles this county has scarcely any remains: there is a gateway of Cambridge Castle, and there are some remains of a castle in Cheveley park and at Burwell, both near Newmarket; and earthworks, marking the site of castles, at Ely, Bourn (between Cambridge and Potton in Bedfordshire), and Castle Camps, near Linton. Some old entrenchments at Swavesey near St. Ives, called the Castle, are probably the remains of a mansion-house. Of Wisbeach Castle and Bassingbourn Castle, near Royston, there are no remains.

At Downham in the Isle of Ely are some remains of an antient palace of the bishops of Ely, and there are some old manor-houses, or remains of manor-houses, in different places.

The principal monastic establishments in the county, besides those at and near Cambridge, Ely, and Thorney (for which see those articles, or the former part [illegible] present article), were Anglesey Priory of Austin canons at Bottisham, between Cambridge and Newmarket (annual value, 149*l.* 18*s.* 6*d.* gross; 124*l.* 19*s.* clear); Denny Abbey, on the edge of the fens for Nuns Minoresses (annual value, 218*l.* 0*s.* 1*d.* gross; 172*l.* 8*s.* 3*d.* clear); and Shengay, a house of the Knights Hospitallers at Wendy, ne (annual value, 175*l.* 4*s.* 6*d.* gross; 171*l.* 4*s.* 6*d.* these there are few remains; none that call for

Of antient ecclesiastical edifices the most str Cambridge and Ely, and Thorney and White there are various others, parts of which will attention of the student of Gothic architecture. ns' *Magna Britannia*; *Beauties of England and* s; Conybeare and Phillips's *Geology of England and Wales*; Arrowsmith's *Map*; and Greenough's *Geological Map of England and Wales*; Turner's and Mackintosh's *Histories of England*; Thierry, *Hist. de la Conquête de l'Angleterre par les Normands*; Rickman *on Gothic Architecture, &c.*)

Statistics.—Population. Cambridgeshire is almost entirely an agricultural county, ranking the sixth in that respect in England. Of 35,715 males 20 years of age and upwards residing within the county in 1831, it was found that 19,385 were engaged in agricultural pursuits, and only 39 were employed in manufactures or in making machinery.

The following summary of the population as it existed in May, 1831, shows the number of inhabitants and their occupations in each hundred of the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males, twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	
Armingford . . .	1,359	1,585	8	22	1,038	345	202	3,817	3,722	7,539	1,862
Chesterton . . .	741	898	5	19	561	241	96	2,143	2,025	4,168	1,078
Cheveley . . .	526	643	3	16	364	144	135	1,630	1,609	3,239	815
Chilford	1,063	1,120	7	14	618	286	216	2,675	2,635	5,310	1,348
Flendish . . .	513	600	4	2	458	110	32	1,381	1,397	2,778	670
Longstow . . .	858	1,048	4	23	728	181	139	2,499	2,476	4,975	1,257
Northstow . . .	710	861	11	10	666	126	69	2,077	2,029	4,106	1,021
Papworth . . .	978	1,208	6	13	779	294	135	2,872	2,725	5,597	1,375
Radfield . . .	788	1,049	6	15	769	190	90	2,387	2,424	4,811	1,224
Staine	692	835	2	5	617	153	65	2,159	2,197	4,356	1,065
Staploe	1,982	2,296	13	35	1,355	613	328	5,371	5,244	10,615	2,721
Thriplow . . .	976	1,006	6	22	652	210	144	2,402	2,409	4,811	1,167
Wetherley . . .	752	928	6	8	706	147	75	2,257	2,155	4,412	1,087
Whittlesford . .	592	693	1	17	389	170	134	1,447	1,533	2,980	756
Isle of Ely.											
Ely	859	881	5	16	664	173	44	2,246	2,120	4,366	1,047
Wisbeach . . .	3,417	3,619	8	93	1,643	1,048	928	8,652	8,612	17,264	4,439
Witchford, North .	3,427	3,618	30	80	2,282	842	494	8,836	8,887	17,723	4,033
Witchford, South .	1,286	1,678	3	12	1,257	284	137	4,000	3,799	7,799	1,927
Cambridge, borough	4,007	4,322	31	179	253	2,232	1,837	10,143	10,774	20,917	5,358
Ely, city . . .	1,246	1,322	2	33	294	424	604	3,037	3,152	6,189	1,465
Totals .	26,712	30,210	161	634	16,093	8,213	5,904	72,031	71,924	143,955	35,715

The population of Cambridgeshire at each of the enumerations made in this century was:—

	Males.	Females.	Total.	Inc. per Cent.
1801	44,081	42,265	86,346	
1811	50,756	50,353	101,109	13·6
1821	60,301	61,608	121,909	20·56
1831	72,031	71,924	143,955	18·08

Showing an increase between the first and last periods of 57,609 persons, or more than 66 per cent., which is 9 per cent. beyond the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three periods of

1811 were £ 85,884, which was [illegible]6*s.* 2*d.*
1821 „ 87,87[illegible] „ 14*s.* 5*d.*
1831 „ 98,[illegible] „ 13*s.* 8*d.*
for each inhabitant.

The expenditure for the same purpose in the year ending 25th March, 1834, was 96,497*l.*; and assuming that the population has increased at the same rate of per-centage as during the ten preceding years, the above sum gives an average of 12*s.* 7*d.* for each inhabitant. All these averages are above those for the whole of England and Wales.

The sum raised in this county for poor's rate, county rate, and other local purposes, in the year ending 25th March, 1833, was 119,817*l.* 1*s.*, and was levied upon the various descriptions of property as follows:—

On land	£95,397	5
Dwelling-houses	22,760	9
Mills, factories, &c.	1,233	5
Manorial profits, navigation, &c. . .	426	2
	£119,817	1

The amount expended was—

	£.	s.
For the relief of the poor	101,331	12
In suits of law, removal of paupers	2,646	18
For other purposes	16,071	7
	£ 120,049	17

The descriptions of property assessed for local purposes are not distinguished in the returns made up for the year ending March, 1834. The total amount levied in that year was [illegible] 7s., and the expenditure was as follows:—

	£.	
For the relief of the poor . .	96,497	
In suits of law, removal of paupers, &c.	3,427	
For other purposes . . .	18,662	
Total .	£ 118,586	4

A saving of expense has therefore been effected for 1834 in the sums expended for the relief of the poor of 4¾ per cent.. The other items are, however, beyond those of the preceding year, and the whole amount of saving is therefore reduced to less than 1¼ per cent.

The number of turnpike trusts in Cambridgeshire, as ascertained in 1829, was 15; the number of miles of roads under their charge was 278; the annual income arising from the tolls and parish composition was 17,341*l.*; the annual expenditure 14,754*l.*

The county expenditure for various purposes, exclusive of the relief of the poor, was as follows in 1833:—

	£.	*s.*	*d.*
Bridges and roads leading to them	0	15	0
Gaols	106	16	6
Expenses of criminal trials at quarter-sessions .	—		
circuits . .	658	14	11
of coroners . .	67	3	6
of militia . .	11	4	8
of county elections .	236	8	2
of shire halls . .	15	13	0
incidental . .	3600	17	0

The sum levied for county rate in 1833 was 3887*l.* 9*s.*

The number of persons charged with criminal offences in Cambridgeshire, in the three septennial periods ending with 1820, 1827, and 1834, were 553, 964, and 1206 respectively, making an average of 79 annually in the first period, of 138 in the second, and of 172 in the last period.

The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county rates, was 44, 40, and 45, respectively: of these were committed for—

	1831.	1832.	1833.
Felonies . .	36	31	40
Misdemeanors .	8	9	5
	44	40	45

The total number of committals in each of the same years was 51, 59, and 47: of whom

The number convicted was	33	39	30
,, acquitted	13	14	11
Dicharged by proclamation	5	6	6
		59	47

At the assizes and sessions in 1835, there were 211 persons in this county charged with crimes; out of which number 24 were tried for offences against the person (15 of which were common assaults); 21 for offences against property committed with violence; and 157 for offences against property committed without violence: of the 9 remaining, 5 were committed for riot, 1 for arson, 1 for maiming cattle, 1 for uttering counterfeit coin, and 1 for taking fish in inclosed waters. Of those committed, 156 were convicted, and 55 were [illegible]ed, or no bills found against them. Most of the puni[illegible]ts of the convicted were very slight: 19 were senten[illegible] imprisonment for periods from 6 months to 1 year: [illegible] 6 months or under: 3 were fined and 1 was discha[illegible] su[illegible]ties. Of the remaining 54, nine were sentenced to death, which sentences were commuted to transportation or imprisonment; the rest of the offenders, 45, were sentenced to transportation for various periods.

Of the offenders 194 were males and 17 females.

Of these 70 could read and write, 49 could read only, 91 could neither read nor write, and the degree of instruction of 1 could not be ascertained. The proportion of the offenders to the population in 1835 was 1 in 682.

Cambridgeshire has two savings-banks; the number of depositors and amount of deposits on the 20th of November, 1832, 1833, and 1834 respectively were:—

	1832.	1833.	1834.
Number of depositors .	1681	1725	1953
Amount of deposits .	£62,839	63,076	66,225

The various sums placed in the savings-banks in 1834 classed as under:—

£	Depositors.	Deposits
Not exceeding 20 .	864	6913
,, 50	649	17,046
,, 100	275	18,836
,, 150	93	10,788
,, 200	61	10,365
Above . . 200	11	2,777
	1,953	66,225

Education.—The following abstract is taken from the parliamentary inquiry on education made in the session of 1835:—

	Schools.	Scholars.	Total.
Infant Schools	21		
Number of infants at such schools, ages from 4 to 7 years:—			
Males		254	
Females . . .		260	
Sex not specified		190	
			704
Daily Schools	550		
Number of children at such Schools, ages from 4 to 15 or 16 years:—			
Males		6094	
Females . . .		5688	
Sex not specified		2783	
Schools	571		14,565
Total of children under daily instruction			15,269
Sunday Schools.	194		
Number of children at such Schools, ages from 4 to 15 or 16 years:—			
Males		5204	
Females		5234	
Sex not specified		3613	
			14,051

Taking the summary of ages obtained at the enumeration of the population in 1821 * as the basis of an approximation, and making allowance for the increase of population at the same rate as in the 10 years preceding 1831, we may assume as being near the truth, that there are at present living in Cambridgeshire 46,966 persons between the ages of 2 and 15, and we may fairly conclude that very few more than half the children, certainly not two-thirds, between the ages of 2 and 15 in the county receive instruction; since a very large number of the scholars attend both daily and Sunday schools. Fifteen schools are both daily and Sunday schools, containing 1247 scholars, and there are many others besides, in which the weekly scholars attend the Sunday schools also.

Maintenance of Schools.

Description of Schools.	By endowment.		By s[illegible]					[illegible]hscrip[illegible] and pay[illegible]ent from scholars.
	Schls.	Scholars.	Sch[illegible]					Scholars.
Infant School	1	31	2	197	16	344		132
Daily Schools	64	2552	32	997	427	9368		1668
Sunday Schools	11	624	180	13,277	—	—		150
Total...	76	3207	214	14,471	443	9692	[illegible]	1950

The schools established by Dissenters, included in the above, are:—

	Schools.	Scholars.	
Infant Schools	1	53	
Daily Schools .	7	290	
			343
Sunday Schools	52	4475	

The schools established since the year 1818 are:—

Infant and other daily schools 245 containing 6153 scholars.

Sunday Schools . . . . 119 ,, 10,394

Thirty-seven boarding schools are included in the number of daily schools in Cambridgeshire.

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* The ages of only 90 1-3rd per cent. of the whole population of Cambridgeshire were then ascertained.

No school in this county appears to be confined to the children of parents of the established church, or of any other particular religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by dissenters, among whom are here included Wesleyan Methodists.

Lending libraries of books are attached to 21 schools in Cambridgeshire.

CAMBUSLANG. [LANARKSHIRE.]

CAMBUSNETHAN. [LANARKSHIRE.]

CAMBY'SES (Καμβύσης), the second king of the Medes and Persians, succeeded his father Cyrus B.C. 529. He led an army against Egypt (B.C. 525), defeated the Egyptian king Psammenitus in a great battle, and reduced Egypt to the form of a Persian province. The ruin of many of the monuments of Egypt is attributed, and perhaps to a certain extent correctly, to the fury of the barbarian invaders and of their king, who was mad. From Egypt Cambyses marched southwards against the Macrobian Ethiopians (a people whose geographical position is not certain), but his army, after suffering severely in the deserts, and being compelled to eat one another, returned to Thebes with much diminished numbers. A detachment of the Persian army which was sent from Thebes against the Ammonium (Siwah) was lost in the desert. After committing numberless extravagancies in Egypt, putting his brother Smerdis to death, marrying his sister, which was contrary to the Persian custom, and then killing her by a kick during her pregnancy, Cambyses died (B.C. 521) of an accidental wound from his own sword at Ecbatana, a town of Syria (not Ecbatana the capital of Media). Ctesias says that Cambyses died at Babylon.

Compare with Herodotus (iii.), which is the authority for what is here stated, the account of Ctesias, *Persica*.

CAMDEN, a post town of Kershaw county, in the State of South Carolina, situated on the east side of the Wateree River, in 34° 20′ N. lat., and 80° 42′ W. long., about 30 miles N.E. of Columbia, and 110 miles N. by W. of Charleston, in the same State. The town, which is regularly laid out, is favourably situated for trade with the interior. The Wateree is navigable up to Camden for boats of 70 tons.

The immediate neighbourhood of this town was the scene of two battles in the war of American Independence. The first was fought on the 16th of August, 1780, between Lord Cornwallis and General Gates, which terminated in favour of the English. The second engagement occurred in the month of April following, when Lord Rawdon sallied from the town and attacked the camp of the Americans under General Greene. The English general was not on this occasion successful, and the town was evacuated on the 9th of May following.

CAMDEN, one of the most illustrious names in the whole catalogue of learned Englishmen. His father was a painter-stainer, living in the Old Bailey, where Camden was born on the 22nd of May, 1551. It is supposed that his father died when he was but a child leaving little provision for him. It is certain that he was admitted into Christ's Hospital within a very few years after its establishment. He was afterwards in St. Paul's School, and finally removed to Oxford, where he appears to have studied in more than one college. He left the university in 1571, and became an under-master of Westminster School, the duties of which situation he discharged at the time when he composed the works which have made his name so eminent.

The most celebrated of these is that entitled 'Britannia,' a survey of the British isles, written in elegant Latin. The first edition of this work was published in 1586. Many others appeared in his life-time with enlargements. A singular fate has attended this book. A long succession of writers have made additions to it, till Camden's 'Britannia,' which as it came forth from him was but a single volume of no large dimensions, has been swelled out in the successive English editions till at length it has become four folio volumes, though the work is still called by his name. One effect of this has been to throw the original work into the shade, and to occasion a wrong apprehension to prevail concerning it, as if it had been composed for the use of the inhabitants of Britain rather than for the information of learned foreigners, and as if it were not that succinct and perfect composition which does so much honour to the taste and judgment as well as to the learning of the author.

The English editions have their value as containing what is at present the best general description of the British isles. But the matter is ill-digested, and the great work of an English Britannia, such as it ought to be, remains to be performed. Bishop Gibson and Mr. Gough were the compilers and editors of the principal English editions.

Camden began now to be looked upon as one of the most distinguished scholars of his age. He began to have an extensive correspondence with the learned both at home and abroad, much of which has been preserved and published. The prebend of Ilfracombe was given to him, though a layman. He was made head master of Westminster School in 1592, and Clarencieux King-at-Arms in 1597, without having passed through the inferior offices of herald or pursuivant. This was distasteful to the old officers of the College of Arms, and led to what must have been to him harassing dissensions.

The remainder of his history is to be found in a catalogue of his writings. We shall touch upon them briefly. His Annals of the reign of Elisabeth is the next in celebrity to his Britannia, an admirable digest of the events of that reign, delivered in pure and elegant Latinity. He intended a similar work on the reign of James, but of this only the heads were prepared. His folio volume of the works of some of our old Latin chroniclers was printed at Frankfort in 1603. It belongs to the set of Latin chroniclers on English affairs, and contains Asser, Walsingham, Giraldus Cambrensis, and others. Among his minor works two only need be mentioned, his 'Remains concerning Britain,' published in 1604, a very amusing and instructive volume; and a small Greek grammar for the use of Westminster School, which was first published in 1597.

Camden reached the age of seventy-two. He died on the 9th November, 1623, at Chiselhurst in Kent, and was interred in Westminster Abbey, a great assemblage of the learned and illustrious doing him honour at his funeral. A monument was erected to his memory which still remains. It has his bust with the left hand resting on the 'Britannia.'

He never married, and at his death left a good estate, the greater part of which he devoted, a little before his death, to founding an historical lecture in the University of Oxford, now called the Camden Professorship of History.

CAMDEN, CHARLES PRATT, EARL OF, was a younger son of Sir John Pratt, who was successively a puisne judge of the court of King's Bench and chief justice of that court, in the reign of George I. He was descended from a family of consideration in Devonshire, of which county Chief Justice Pratt, his father, was a native. Charles Pratt was born in the year 1714. He went at an early age to Eton; and in 1731, having obtained the election to King's-College, Cambridge, he removed to the university. He became a fellow, according to the usual routine, in 1734; in the summer of 1738 he was called to the bar, and in the following year took his master's degree. He made his first entrance into the profession in the courts of common law, and travelled the western circuit for several years with little or no practice. Conceiving his prospects of success in the profession of the law to be hopeless, he at one time resolved to abandon it and seek his fortune in the church. Henley, afterwards Lord Chancellor Northington, who was at that time in considerable practice on the western circuit, is said to have dissuaded him from the execution of this purpose, and to have induced him to continue in his course until his turn for business and advancement should arrive. He had the good sense to follow this judicious advice, and shortly afterwards his business began to increase. His practice as a junior, however, appears never to have been considerable. His name appears occasionally in the reports of cases of parochial settlement from the western circuit; and in 1752 we find him employed as one of the counsel in defence of Owen, the bookseller, who had been prosecuted by the attorney-general for publishing a libel upon the House of Commons (Howell's *State Trials*, vol. xviii. p. 1203). In the following year he also appeared as counsel for the prisoner in the trial of Timothy Murphy for forging a will, a case which excited much attention at the time (Howell's *State Trials*, vol. xix. p. 693). But previously to his appointment as attorney-general, he had much less general practice in the courts of Westminster-hall than several advocates whom at a subsequent period of his life he left far behind him in professional advancement. In the course of the change of administration which took place in June, 1757, Sir Robert Henley, the early friend and adviser of Pratt, was promoted from the office of attorney-general to that of lord keeper; and upon occasion of this vacancy, Lord Chatham, who had been a contemporary with Pratt at Eton, and placed great confidence in him, insisted upon his being made attorney-general; and he was immediately afterwards returned to parliament as representative of the now abolished borough of Downton, in Wiltshire. During the four years that he continued to be a member of the House of Commons he did not take any very active or dis- [illegible]hed part in the debates.

[illegible]fessional business while he was attorney-general [illegible]very extensive, particularly in the court of chancery. [illegible]cial conduct as attorney-general appears to have been uniformly judicious and moderate. The only ex-officio information for libel filed by him was instituted against Dr. Shebbeare for his 'Letter to the People of England;' of which Horne Tooke says (Howell's *State Trials*, vol. xx. p. 708) 'that if ever there was an infamous libel against government surely it was that.' In his speech upon the trial of this information, Pratt declared that 'he did not wish for the conviction of the defendant if any man in the world could entertain a doubt of his guilt.' His language and demeanour, as the official advocate for the prosecution on the trials of Dr. Hensey for treason, and Earl Ferrers for murder, were fair and temperate; he contented himself with a simple statement of the facts, without attempting to inflame or aggravate the charge. It may be observed, however, that in this respect he only followed the example of his immediate predecessors; moderation and self-restraint in the conduct of government prosecutions had been conscientiously observed by the crown advocates,—by Somers, Yorke, and Murray, ever since the revolution; and it was chiefly at a period previous to that event, and subsequently to Lord Camden's time, that a practice prevailed less consistent with humanity and good taste.

The death of Chief Justice Willes, at the close of 1761, caused a vacancy on the bench of the common pleas; and this being one of those judicial offices of which by long usage the attorney-general for the time being is considered to have the refusal, it was accordingly offered to Pratt, and accepted by him. Soon after his elevation to the bench the great question respecting the legality of general warrants was raised, by the proceedings of government with relation to the celebrated John Wilkes. Lord Chief Justice Pratt expressed his opinion against the asserted power of the secretary of state to authorize arrests, or the seizure of papers upon general warrants, with a greater degree of warmth than was usual, or perhaps justifiable, in pronouncing a mere judicial decision; but his energy on this occasion was entirely in accordance with the prevailing feeling of the times, and produced for him a larger share of popular favour than had been possessed by any judge in England since the revolution. Addresses of thanks were voted to him by many of the principal towns, and several public bodies presented him with the freedom of their respective corporations. The city of London, in particular, placed his portrait in Guildhall, with an inscription in honour of the 'maintainer of English constitutional liberty.'

When the Rockingham administration came into power, in the summer of 1765, Lord Chief Justice Pratt was raised to the peerage by the title of Baron Camden, of Camden Place, in the county of Kent. He did not however by any means become an adherent of that ministry; on the contrary, he made a vigorous opposition to one of the first measures introduced by them in the ensuing parliament, namely, the resolution asserting the right of Great Britain to impose laws upon the American colonies in all cases whatsoever; by which resolution, and an act to be founded upon it, the government proposed to qualify the repeal of the obnoxious stamp act of the previous session. He also gave his decided opposition to the declaratory act to the same effect as the resolutions which afterwards accompanied the repeal of the stamp act.

When Lord Rockingham's ephemeral administration broke up in July, 1766, Lord Northington, being removed from the court of chancery, became president of the council; and upon the occurrence of this vacancy, the seals were given to Lord Camden.

The duke of Grafton's administration, composed as it was of the most heterogeneous materials, so 'chequered and speckled,—a piece of joinery so crossly indented and whimsically dove-tailed,' as Burke described it, contained within itself the elements of its dissolution; and its fall was accelerated by the proceedings of the House of Commons relating to John Wilkes, and the measures respecting America, both of which had excited a violent fermentation in the public mind. Upon the opening of the session of 1770, Lord Camden declared in the House of Lords his opposition to government, and actually voted for Lord Chatham's amendment to the ministerial address. Such a declaration by the lord chancellor, accompanied by an unequivocal act of hostility to the government, necessarily led to his removal from the woolsack.

Lord Camden's character as a presiding judge in the court of chancery is thus described by a contemporary writer:—'He was blessed by nature with a clear, persuasive, and satisfactory manner of conveying his ideas. In the midst of politeness and facility, he kept up the true dignity of his important office: in the midst of exemplary patience (foreign to his natural temper, and therefore the more commendable), his understanding was always vigilant. His memory was prodigious in readiness and comprehension; but above all, there appeared a kind of benevolent solicitude for the discovery of truth that won the suitors to a thorough and implicit confidence in him. He was apt on the other hand to be a little too prolix in the reason of his decrees, by taking notice even of inferior circumstances, and viewing the question in every conceivable light. This however was an error on the right side, and arose from his wish to satisfy the bar and his own mind, which was (perhaps to a weakness) dissatisfied with its first impressions however strong. He had other faults that have met with severe and deserved censure: he wore a tie-wig in court, and has been frequently observed to garter up his stockings while the counsel were the most strenuous in their eloquence.' (Almon's *Anecdotes*, vol. i. p. 384.)

With the surrender of the seals, in 1770, Lord Camden's judicial career finally closed; and during the remaining twenty-four years of his life he was entirely a political character. His general parliamentary conduct during the remarkable session of 1770, consisted in a strenuous opposition to the policy of Lord North's administration; and Lord Mansfield was on most occasions his personal antagonist. The doctrine asserted by Lord Mansfield on the trials of Woodfall and Miller, that the jury, in cases of libel, were to decide upon the fact of publication only (a question which was not finally determined until the passing of Mr. Fox's libel act, in 1792), was warmly reprobated by Lord Camden in the House of Lords; and upon this and upon other occasions he indulged in a degree of personal bitterness towards the chief justice which is variously accounted for by contemporary writers, but which certainly derogates from the dignity and general merit of Lord Camden's character. Lord Camden also uniformly opposed the ill-advised policy of Lord North respecting America; and in 1778 he signed, and is said to have framed the protest of the Lords against the rejection of Lord Rockingham's motion for an address to the king, praying him to disavow the obnoxious manifesto of the American commissioners. On the recal of Lord Rockingham and the Whigs to power in 1782, Lord Camden was appointed president of the council; but was displaced upon the formation of the Coalition-ministry in 1783. To this administration he placed himself in zealous opposition; and in the debate on Mr. Fox's India bill in the House of Lords, he distinguished himself by an able and eloquent speech against the measure. The fate of this bill put an end to the short existence of the Coalition-ministry; and soon after the formation of Mr. Pitt's administration, Lord Camden was reinstated in the office of president of the council, which he continued to hold during the remainder of his life. Though now upwards of 70 years of age, and though his health was considerably impaired by repeated attacks of gout, he continued his attendance in the House of Lords, and actively assisted in the several debates upon the Indian Judicature Bill, the Wine Excise Bill, and several other important measures which were introduced during the early part of Mr. Pitt's administration; and upon the occasion of the king's derangement in 1788, he introduced the plan proposed by government for the establishment of a regency. In 1786 he was created Earl Camden, and received the additional title of Viscount Bayham, of Bayham Abbey, in the county of Kent. The last occasion upon which he took a part in the debates was upon the discussion of Mr. Fox's celebrated Libel Act, in 1792. The question of the province of juries in cases of libel was one which during the whole of his life had deeply interested him: in his defence of Owen, in 1752, he had warmly asserted the popular doctrine upon this subject; and on the introduction of this bill into the

House of Lords he particularly distinguished himself by the animation and eloquence with which, in advanced age, he maintained the principle which in his early years he had often zealously espoused.

Lord Camden died on the 13th of April, 1794, in the 80th year of his age. It is remarkable that until very lately no connected biography of a man so distinguished as a statesman and judge should have been published. Some remarks on his political and judicial character may be found in Almon's *Anecdotes of Eminent Persons*, vol. i.; and an extremely well-written life of him is contained in the *Law Magazine* for February, 1818.

CAMEL, a genus of ruminants without horns, *Gamal* of the Hebrews, *Djemal* of the Arabs, *κάμηλος* (camelus) of the Greeks, *Camelus* of the Romans, *Cammello* of the Italians, *El Camello* of the Spaniards, *Kameel* of the Germans, and *Chameau* of the French.

Teeth, &c., thirty-four. Sixteen in the upper jaw; viz., two incisors—for the camels and the llamas have these, and form the exceptions, the other ruminants being without any incisors in the upper jaw—two canines, twelve molars. *Eighteen* in the lower jaw; viz., six incisors, two canines, ten molars. The incisors of the upper jaw bear a close resemblance to canine teeth, for they are conical, compressed at the sides, pointed, and somewhat curved or hooked. There is another difference between the camels and the other ruminants: the former have the scaphoïd and cuboïd bones of the tarsus separated. Instead of the great horny case or shoe, which envelopes all the lower part of each toe and determines the figure of the ordinary cloven hoof, the camels have only a small one, or rather the rudiment of one, adhering only to the last joint of the toe, and symmetrical in form, like the hoofs of the *Pachydermata*. These and other peculiarities of form lead to the opinion that the camels and the llamas form the link between the *Ruminants* and *Pachydermata* (thick-skinned animals).

General osteology. For this we must refer the reader to Dr. Walter Adam's paper on the osteological symmetry of the Bactrian camel in the 'Transactions of the Linnean Society of London,' vol. xvi. p. 525.

The *generic characters* may be thus summed up:

Lower incisors in the form of cutting wedges; upper incisors sub-lateral; canines conical, sub-erect, strong; false molars situated in the interdentary space on either side.

Head long; upper lip cleft; nostrils slit obliquely; eyes prominent; ears small. Neck elongated. Back with fleshy bosses or hunches; tail moderate. Toes united below. Teats ventral, four in number. Hair inclining to woolly. Callosities on the breast, and flexible points of the extremities.

The upper lip of the camel swollen and divided, the projecting orbits of its eyes, the lengthened and certainly not graceful neck, the back bossed with a hump or humps, and croup comparatively weak, supported upon the long and awkward-looking legs terminating in apparently disproportioned feet, are not materials for producing elegance of form; and indeed the air of the animal is altogether grotesque: but this uncouth shape is, as we shall presently see, one of those admirable examples of contrivance which must strike the most casual observer.

The two species of camel were well known to Aristotle, who, in his 'Natural History' (ii. 1), mentions both the Arabian and the Bactrian, remarking that the latter has two humps, whereas the former has but one. That accurate observer was well aware that, though the camel is retromingent, it is not retrocopulant (ii. 1., v. 2). In the chapter last quoted, he describes the union with the female with the greatest accuracy; and modern observations concur entirely with his account. Pliny, on the contrary (*Hist.* x. 63), with his usual attachment to the marvellous, repeats the common error, notwithstanding: 'Coitus aversus elephantis, *camelis*, tigribus, lyncibus, rhinoceroti, leoni, dasypodi, cuniculis, quibus aversa genitalia.' In the rutting season a fetid humour is said to distil from their heads, and the male, who is very violent at such seasons, protrudes, with a singular noise, a portion of the *velum palati*. From the passage in Pliny (*Hist.* viii. 51), 'De suibus,' it would appear that it was not unusual to castrate the females, 'Castrantur fœminæ quoque sic uti cameli.' Camus refers also to Ælian (*De Nat. Anim.*, iv. 55).

Organization, and its adaptation to the habits of the animal. The problem being proposed to construct an animated machine that should be best calculated to meet the exigencies of the animal, where could we find a better solution of it than in the construction of the camel? The pads or sole-cushions of the spreading feet are divided into two toes without being externally separated, which buoy up, as it were, the whole bulk with their expansive elasticity from sinking in the sand, on which it advances with silent step—the nostrils so formed that the animal can close them at will to exclude the drift sand of the parching simoom—the powerful upper incisor teeth for assisting in the division of the tough prickly shrubs and dry stunted herbage of the desert—and, above all, the cellular structure of the stomach, which is capable of being converted into an assemblage of water tanks, bear ample testimony to the care manifested in the structure of this extraordinary quadruped.

The stomach of the camel has been well described by Sir Everard Home; and, as this organ is of such peculiar importance to the animal, we proceed to give his description.

'The camel's stomach, anteriorly, forms one large bag, but when laid open this is found to be divided into two compartments, on its posterior part, by a strong ridge, which passes down from the right side of the orifice of the œsophagus, in a longitudinal direction. This ridge forms one side of a groove that leads to the orifice of the second cavity, and is continued on beyond that part, becoming one boundary to the cellular structure met with in that situation. From this ridge eight strong muscular bands go off at right angles, and afterwards form curved lines, till they are insensibly lost in the coats of the stomach. These are at equal distances from each other, and, being intersected in a regular way by transverse muscular septa, form the cells. This cellular structure is in the left compartment of the first cavity, and there is another of a more superficial kind on the right, placed in exactly the opposite direction, made up of twenty-one rows of smaller cells, but entirely unconnected with the great ridge. On the left side of the termination of the œsophagus, a broad muscular band has its origin from the coats of the first cavity, and passes down in the form of a fold parallel to the great ridge, till it enters the orifice of the second, where it takes another direction. It is continued along the upper edge of that cavity, and terminates within the orifice of a small bag, which may be termed the third cavity. This band on one side and the great ridge on the other form a canal, which leads from the œsophagus down to the cellular structure in the lower part of the first cavity. The orifice of the second cavity, when this muscle is not in action, is nearly shut: it is at right angles to the side of the first. The second cavity forms a pendulous bag, in which there are twelve rows of cells, formed by as many strong muscular bands, passing in a transverse direction, and intersected by weaker muscular bands, so as to form the orifices of the cells. Above these cells, between them and the muscle which passes along the upper part of this cavity, is a smooth surface, extending from the orifice of this cavity to the termination in the third.

'From this account it is evident that the second cavity neither receives the solid food in the first instance, as in the bullock, nor does the food afterwards pass into the cavity or cellular structure. The food first passes into the first compartment of the first cavity, and that portion of it which lies in the recess, immediately below the entrance of the œsophagus, under which the cells are situated, is kept moist, and is readily returned into the mouth along the groove formed for that purpose, by the action of the strong muscle which surrounds this part of the stomach, so that the cellular portion of the first cavity in the camel performs the same office as the second in the ruminants with horns. While the camel is drinking, the action of the muscular band opens the orifice of the second cavity at the same time that it directs the water into it; and when the cells of that cavity are full, the rest runs off into the cellular structure of the first cavity immediately below, and afterwards into the general cavity. It would appear that camels when accustomed to go journeys, in which they are kept for an unusual number of days without water, acquire the power of dilating the cells so as to make them contain a more than ordinary quantity as a supply for their journey; at least, such is the account given by those who have been in Egypt. When the cud has been chewed, it has to pass along the upper part of the second cavity before it can reach the third. How this is effected without its falling into the cellular portion, could not, from any inspection of dried specimens, be ascertained; but when the recent stomach is accurately examined, the mode in which this is managed becomes very obvious. At the time that the cud has to pass from the mouth, the muscular band contracts with so much force, that it not only opens the orifice of the second cavity, but acting on the mouth of the third brings it forward into the second, by which means the muscular ridges that separate the rows of cells are brought close together, so as to exclude these cavities from the canal through which the cud passes.'

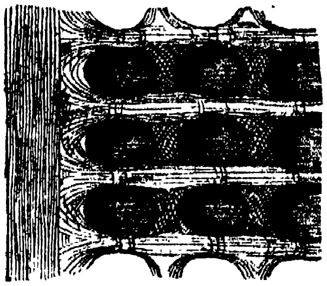
In the Museum of the Royal College of Surgeons there is a dried preparation of the digestive organs of the camel, and in the gallery (Nos. 567, 568, and 569) portions of them may be seen preserved in spirit. The author of the account above-quoted having stated that John Hunter did not give credit to the assertion that the camel can retain a quantity of water in its stomach unmixed with the food, and capable of being recovered after the animal has been killed, it became necessary that there should be some explanation of that great physiologist's real views of the subject. We find, accordingly, in the valuable catalogue of the college museum, under No. 567, which exhibits a portion of the reticulum or water-bag, the following interesting narrative:—

'There exists a general belief, founded on the concurrent testimonies of travellers who have visited the desert regions inhabited by the camel, that that animal can retain a quantity of water in its stomach unmixed with the food, and capable of being recovered after the animal has been killed. Perrault (*Mém. pour servir à l'Hist. Nat.* Paris, 1676) and Daubenton (Buffon, *Hist. Nat.* 4to. t. xi. p. 227) drew the same conclusion from their dissections of the camel; but it has been said that "Mr. Hunter did not give credit to the assertion." On referring, however, to the work stated by Sir Everard Home, in his *Lectures on Comparative Anatomy*, to contain Mr. Hunter's observations on the subject, he would appear rather to have maintained a contrary opinion. The passage occurs in the following note by Dr. Patrick Russell, in the Appendix to his brother's History of Aleppo:—"That water, in cases of emergency, is taken from the stomach of camels, is a fact neither doubted in Syria nor thought strange. I never was myself in a caravan reduced to such an expedient; but I had the less reason to distrust the report of others, particularly of the Arabs, seeing that even the love of the marvellous could in such a case be no inducement to invention. It may perhaps be superfluous to produce the authority of an Arab historian (Beidawi), who, in his account of the Prophet's Expedition to Tabuc against the Greeks, relates, among other distresses of the army, that they were reduced to the necessity of killing their camels for the sake of the water contained in their stomachs. (Sale, *Koran*, p. 164; Gibbon, *Decline and Fall of the Roman Empire*, v. p. 245.)"

'On my return from the East Indies, in 1789, hearing accidentally that my friend Mr. John Hunter had dissected a camel, and was supposed to have expressed an opinion that the animal's power of preserving water in its stomach was rather improbable, I took an opportunity of conversing with him on the subject, when (to the best of my recollection) he told me "that he by no means drew any such absolute inference from his dissection; that he saw no reason for assigning more than four stomachs to the camel, though he could conceive that water might be found in the paunch little impregnated by the dry provender of the desert, and readily separating or draining from it."

"In hopes that other particulars might be found among the papers of my lately-deceased friend, I applied to his brother-in-law, Mr. Home, who informed me that he had examined them, but without discovering any observations on the subject." (Vol. ii. p. 425.)

'From these remarks, then, it appears that the small cavity regarded by Daubenton as analogous to a reticulum, was not considered by Mr. Hunter as of sufficient importance to be ranked as a distinct stomach; and the water-bag must therefore, in his opinion, have held the place of the honeycomb-bag in the horned ruminants. And when we compare the relation of the reticulum to the rumen in that tribe, with the corresponding free communication which subsists between the water-bag and rumen in the camel tribe; and when also we observe in both the precise correspondence in the mode of communication of these two cavities with the œsophagus and with the muscular apparatus destined to convey the remasticated food beyond their apertures into the third cavity, and at the same time find an approach to the peculiar disposition of the cells of the water-bag in the reticulum of some of the horned ruminants; it becomes evident that the two cavities are analogous, the reticulum of the camel being modified for its destined functions by the greater development of the secondary cells, by the absence of a cuticular lining, and by the production of the inner layer of the muscular tunic, which forms the apparatus for closing the orifice of the primary cells. The third cavity, therefore, which could not have been recognised as a distinct compartment in the llama, and which undoubtedly receives the remasticated food in the camel, ought rather to be regarded as a peculiar structure, to which nothing analogous is to be found in the stomachs of the horned ruminants.'



[Cells of Camel's Stomach, one-ninth of natural size.]

Here is represented the muscular arrangement provided for closing the orifices of the cells, so as to prevent the food from falling into them. The cells themselves are exposed, bringing into view their bottoms, the muscular conformation of which enables the animal to give out their contents.

The seven callosities on the flexures of the limbs and chest, and the hump on the back, seem, perhaps, to bear more relation to the necessities of the animal, considered as the slave of man. These callosities are the points whereon the animal rests when it kneels down to receive its burthen; and there are not wanting those who argue that they are the result of this domesticated state, as corns are produced by the pressure of a tight shoe. Santi observed these callosities upon a young camel just after its birth, at Pisa: but it may be said, particularly as there is no period known when the camel was not under the control of man, that these callosities have been handed down from generation to generation from the aboriginal enslaved race. On the other hand, a child is not born with corns; nor can the instances of hornless oxen and sheep and rumpless fowls, where a defect has been carefully followed up till the horn or rump has disappeared, be looked upon as parallel. We must add, moreover, that the hump, which is a fatty secretion, is known to be absorbed into the system when the animal is pinched for food, thus forming a provision against the casualties of a life ordained to be spent in the desert; nor are the callosities more than we should expect as protections for those parts of the limbs on which the body, when the animal is taking its rest, is supported on the arid sands.

Uses.—The camel furnishes the Arab with flesh and milk; of its hair he weaves clothing and even tents; his belt and his sandals are the produce of its hide; and the dung affords him fuel. The soot of this fuel, after having undergone the process of sublimation in closed vessels, produced the *sal ammoniac*, or *muriate* of *ammonia*, which was formerly imported from Egypt into this country, where the alkali is now, however, manufactured in a variety of ways. In the East the hair of the camel is made into cloth; the raiment of John the Baptist was of camel's hair. (*Matthew*, iii. 4; *Mark*, i. 6.) It is principally imported into these islands for the manufacture of pencils for the painter. The hair which is the product of Persia is held in the greatest estimation. There are three qualities—black, red, and grey; the black brings the best price, the red comes next in value, and the grey is only valued at half the price of the red. But these uses are mere trifles when compared with the paramount importance of these animals as commercial vehicles, 'ships of the desert,' as they have been poetically termed; for they are the living machines by means of which communication is kept up across the most desolate and frightful deserts, which, without some such aid, would be entirely impassable by man. These toilsome journies over the most dreary and inhospitable regions, the organization of the camel, of which a sketch has been attempted, and its extreme temperance, enable it to perform with comparative ease.

The load of a *heavy* or slow-going camel in one of the caravans is, according to Major Rennell, from 500 to 600 weight. The latter is the amount given by Sandys as the ordinary load; 'yet,' he adds, 'will he carry a thousand.' At Pisa the burthen of a full-grown camel is stated to be sometimes fourteen kilogrammes (above 800 lbs.) The mode of training the beast to bear these loads seems to vary. Bruo, speaking of an African mode (Senegal), towards the end of the seventeenth century, says, 'Soon after a camel is born, the Moors tie his feet under his belly, and having thrown a large cloth over his back, put heavy stones at each corner of the cloth, which rests on the ground. They in this manner accustom him to receive the heaviest loads.' Santi describes the method adopted at Pisa. At the age of four years, a camel which is intended for labour is broken in. The trainers first double up one of his fore-legs, which they tie fast with a cord; they then pull the cord, and thus usually compel the animal to fall upon his bent knee. If this does not succeed, they tie up both legs, and he falls upon both knees and upon the callosity which is upon his breast. They often accompany this operation with a particular cry and with a slight blow of a whip. At this cry and blow, with the addition of a sudden jerk downwards of his halter, the camel gradually learns to lie down upon his belly, with his legs doubled under him, at the command of his driver. The trainers then accustom him to a pack-saddle, and place on it a load, at first light, but increased by degrees, as the animal advances in docility, till at last, when he readily lies down at the voice of his driver, and as readily rises up with his load, his education is so far complete. The camels at Pisa, it appears, do not complain if too heavily laden; but in Egypt, according to Denon, they remonstrated loudly on such occasions, crying out when they were laden too heavily or unequally.

In travelling with a caravan, the acute sense of smelling possessed by the camel is strikingly displayed. When apparently completely worn out, and when all have been on the point of perishing with thirst, he has been known to break his halter and run with unerring certainty to a spring which had escaped the observation of the other quadrupeds of the caravan, and of man himself. Some of these accounts of the pilgrimages and other journeyings across the deserts are full of the wild and wonderful; but our limits do not allow us to enter into the details, for which we must refer the reader to a very interesting account of the camel in 'The Menageries,' vol. i., and the authors there quoted, as well as others who have written on the subject; and almost every African and oriental traveller has done so.

Geographical distribution.—Arabia, Persia, the south of Tartary, some parts of India, and Africa, from Egypt to Mauritania, and from the Mediterranean to the river Senegal, appear to be the countries over which the Arabian camel is principally distributed. It is also numerous in the Canary Islands. That it was a native of Asia from the earliest times, and the great oriental commercial vehicle of ancient as it is of modern days, cannot be doubted. We trace it repeatedly in the Scriptures. Thus when Joseph's brethren had cast him into the pit, and, after the commission of their crime, had sat down to eat bread, 'they lifted up their eyes and looked, and, behold, a company of Ishmaelites came from Gilead, with their camels bearing spicery and balm and myrrh, going to carry it down to Egypt' (Gen. xxxvii. 25) Again, in Judges, viii. 21, we read that 'Gideon arose and slew Zebah and Zalmunna, and took away the ornaments that were on their camels' necks.' In Genesis xxxii. 7, we find that Jacob 'divided the people that was with him, and the flocks, and herds, and the camels, into two bands;' and the domestic state of the animal at this early period is further proved by verse 15 of the same chapter, where we see, as part of the present sent by Jacob to propitiate Esau, 'thirty milch camels with their colts.' In Leviticus, xi. 4, the camel is enumerated among the forbidden animals, 'because he cheweth the cud, but divideth not the hoof: he is unclean unto you.' Part of Job's 'substance (i. 3) consisted of three thousand camels;'* and the third messenger of evil informs him (i. 17) that 'the Chaldeans made out three bands, and fell upon the camels, and have carried them away.' When, after his afflictions, the Lord blessed the latter end of Job more than his beginning' (xlii. 12), 'six thousand camels' formed a portion of the blessing. And here we may observe that though the inquiry has been the subject of much research, there is no satisfactory evidence of the existence of the camel in an originally wild state at any period whatever. Diodorus and Strabo indeed mention its existence in such a state in Arabia; and Desmoulins, who has written most valuably on the subject, asserts that it so existed in the time of Hadrian: the natives, too, of Central Africa maintain, it is said, that the animal is to be found wild in the mountains where Europeans have never penetrated. But it is far from improbable that these wild camels might, like the wild horses of the American prairies, have owed their parentage to camels which had escaped from the control of man. Cuvier, in relating the report of Pallas upon the evidence of the Bucharians and Tartars, that there are wild camels in the deserts of the middle of Asia, well remarks that it must not be forgotten that the Calmucks give liberty to all sorts of animals from a religious principle.

In Europe, Pisa seems to be the only locality where the camel is now bred. At San Rossora the arid plains and stunted bushes bear some distant resemblance to the Asiatic and African desert; but most authors who understand the subject agree in considering that the race is fast degenerating. The time of their introduction into Tuscany does not seem to be accurately known, but there is good evidence that the assertion of their having been reared at Pisa since the time of the crusades, made by the writer of a somewhat eccentric work on geology, rests on no very sure foundation. The sixteenth century would be probably a date nearer the truth. In 1732, when the stud at San Rossora was dwindled down to six females, the government strengthened it by the importation of thirteen males and seven females from Tunis; in 1789 it numbered one hundred and ninety-six, including both sexes; and in 1810 it had fallen off to about one hundred and seventy.

The Arabian camel was introduced into Spain by the Moors; and the southern districts possessed many of these animals for a considerable period after the conquest of Granada: but they are now no longer to be found as a species in the Spanish territory. After the conquest of Spanish America, an attempt was made to introduce them into that country by Juan de Reinega, a Biscayan; and Acosta saw them, towards the end of the sixteenth century, at the foot of the Andes. But the introduction of these animals was looked upon with no favourable eye by the ruling Spaniards, and they gradually dwindled away. They have, however, been lately imported with greater success from the Canary Islands. Humboldt mentions them, and particularly some that he saw feeding under a palm-tree near New Valencia.

Species 1.—*Camelus Bactrianus*, Linn.; *Le Chameau*, Buffon.

The Bactrian Camel.

Two humps on the back. Length about ten feet. Hair shaggy, particularly under the throat. Colour generally dark brown. Localities, Persia, Turkey, &c.

Pallas, as we have before observed, states that very large camels, with two hunches, occur in a wild state in the deserts of Shamo, towards the frontiers of China. But it must be

[Camelus Bactrianus.]

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* Camus notices that Aristotle observes that there have been persons who have possessed as many as three thousand camels, the precise number of Job's.

recollected that the Calmucks, as is before noticed, liberate all animals upon a principle of religion. The species is comparatively rare; but in the middle zone of Asia, north of the Taurus and the Himalaya mountains, it is found in comparative abundance. Not that it is not to be seen occasionally in other countries; in Arabia, for instance; but such instances are said to be uncommon. The Bactrian camel is stouter and more muscular than the Arabian

ies, and his strength is in proportion.

y.—White or cream-colour.

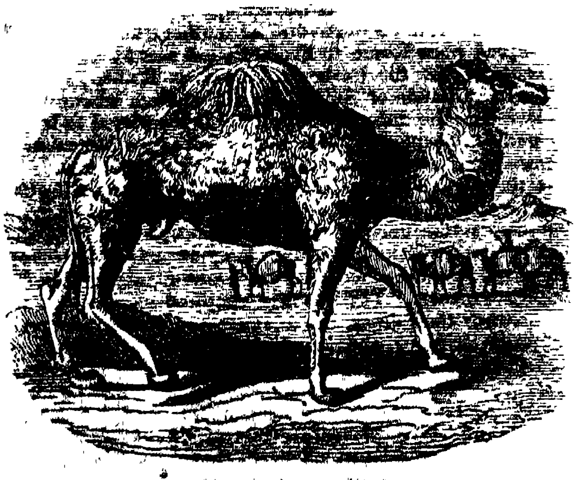
es 2.—*Camelus Dromedarius*, Linn.; *Le Dromadaire*, Buffon.

The Dromedary.

One hump, situated on the middle of the back. Length, about eight feet. Hair, pale brown. Localities, Arabia, Africa, &c.

Purchas (book vi., c. 1, s. 9) says that of camels there are three kinds; the first called Huguin, of tall stature and able to carry a thousand pounds weight; the second less, having a double bunch, fit for carriage and to ride on, called Becheti, bred only in Asia; the third sort, called Raguahill, small, able to travel (for they are unfit for burthens) above an hundred miles in a day. The king of Tombuctoo can send messengers on such camels to Segelmesse or Darha, nine hundred miles distant, in the space of eight days at the farthest. He further states that such enduring swiftness would be almost incredible, were it not corroborated by the best authorities, who all agree in their accounts of the speed of the Heirie, *El heirie*, or Maherry of the desert—Purchas's Raguahill. 'When thou shalt meet a heirie,' say the Arabs in their poetical mode of expression, 'and say to the rider Salem Aleik, ere he shall have answered thee Aleik Salem, he will be afar off, and nearly out of sight, for his swiftness is like the wind.' The 'Sabayee,' said to be the fastest breed of the swift dromedary, will, it is asserted, perform a journey of thirty-five days' caravan travelling (about eighteen miles a day) in five days, performing six hundred and thirty miles in that small period of time. Riley often travelled on a dromedary at the rate of seven or eight miles an hour for nine and ten hours a-day; and Lyon says that the Maherry of the Northern African Arabs will continue at a long trot of nine miles an hour for many hours together.

Varieties.—Besides the swift variety above alluded to, the species varies in colour, like the Bactrian, being sometimes cream-coloured or even white. There are specimens of each colour in the gardens of the Zoological Society in the Regent's Park.



[Camelus Dromedarius.]

The natural family of the *Camelidæ* comprises also the South American form so well known by the name of *Llama*. [LLAMA.]

FOSSIL CAMELS.

It is said that the fossil remains of a camel have been found in the Sub-Himalayan range by Captain Cautley, to whom geologists are already so much indebted for his Palæontological communications.

CAMEL, a machine invented by the Dutch, about the year 1688, by which vessels can be carried into harbours which without such aid would be inaccessible. The camel, as described by Beckmann in his 'History of Inventions,' consisted of two half ships, built in such a manner that they could be applied on each side of the hull of a large vessel. On the deck of each part of the camel a number of horizontal windlasses were placed, from which ropes proceeded through openings in one half, and being carried under the keel of the vessel, entered similar openings in the other half on the opposite side, and were attached to the windlasses on its deck. When about to be used, as much water as was necessary was suffered to run into them; all the ropes were then cast loose, and large beams were placed horizontally through the port-holes of the vessel, the ends resting on the camels alongside. When the ropes were made fast, and the vessel properly secured between the camels, the water was pumped out, on which the camels rose and bore up the vessel. A ship drawing fifteen feet water could by this means be made to draw only eleven; and the largest ships of war could be made to pass without obstruction all the sand banks of the Zuyder-Zee. Improved methods of preventing the obstruction of harbours have superseded the use of the camel. A plate of the camel is given in the French 'Encyclopédie.' (Beckmann's *History of Inventions*, vol. iii. pp. 337—343.)

CAMELFORD. [CORNWALL.]

CAME'LLIA, a genus of greenhouse shrubs belonging to the natural order Ternstromiaceæ in polypetalous dicotyledons, and nearly related to the plants which yield the tea of the shops. All the species are natives of China and Japan, or of corresponding climates in the north of India, whence they have been introduced to Europe. C. Japonica, a species with broad shining leaves and red flowers, is the origin of the numerous beautiful varieties now so common in gardens. The principal part of these have been raised by the skill of the Chinese or Japanese, and are remarkable not only for their gay colours, but for the great symmetry with which their petals are arranged, the flowers when seen in perfection resembling nothing so much as beautiful shell-work. The sorts that have been raised in this country are in most instances inferior to the Chinese in symmetry, but they occasionally surpass them in richness of colour. Camellias succeed best when treated as conservatory plants, that is, when planted in the open border under glass, and just protected from the frost, especially if they are freely exposed to light and air. They then grow into large evergreen bushes, covered with a dense foliage, upon which their gaudy flowers are beautifully relieved, and are far handsomer objects than when their roots are confined within the narrow compass of a garden-pot. Many of the varieties are nearly hardy, that is, they can bear the ordinary winters of England almost without protection; but then are so very inferior to the conservatory specimens as to be little worth the having as out-of-doors shrubs, unless upon our south west coast, in some of the warm bays of Devonshire and Cornwall. They are multiplied by cuttings, grafts, and buds, and also by seeds, which the Waratah and some single sorts produce in plenty.

The other species of camellia in our gardens which deserve notice are, the *C. maliflora* or the *apple-blossomed*, which is probably a mere variety of the last; *C. oleifera*, whose seeds yield a valuable oil in China; and *C. reticulata*, which is by far the handsomest of all. The leaves of this species are very remarkably netted, and the semi-double flowers, which are sometimes as much as six inches across, are of a deep rich rose-colour. It evidently prefers to be treated as a conservatory plant, by being planted in a pit, or green-house, in the open mould. If confined in a pot, its leaves are apt to become white and unhealthy. If placed in a bright hot-house its leaves and flowers are rendered much deeper coloured, but altogether smaller, and the shoots more stunted. This sort will not easily propagate either by buds, or cuttings, or grafts, like the common camellia, but requires to have its young wood inarched upon healthy young camellia stocks, when it takes freely; but the parent plant suffers so much from the mutilation attendant upon this process, that it is two or three years before it is sufficiently recovered to submit again to the operation.

CAMELOPARD. [GIRAFFE.]

CAMELOPA'RDALUS, the camelopard or giraffe, a constellation formed by Hevelius. A line drawn from Capella to the pole-star passes right through the body of the constellation: the hind part precedes in right ascension, of which the whole ranges from four to eight hours. The letters are of course [illegible] Bayer. The following [illegible] principal stars.

Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi ().	Astron. Society.	
	9	552	4
b	7	564	5
*d*¹	10	577	4½
	31	715	5
	40	764	6½
	42	830	4½
q	43	835	4½
	55	988	5
	(51)	371	4
	(54)	373	4½
	(201)	834	5
	(292)	874	4½
	(335)	761	5

· The first star is Piazzi, iv. 176: it was considered by Flamsteed as in Ursa Major. (Baily's *Flamsteed.*)

CAMEO, or CAMAIEU. There has been much unsatisfactory discussion respecting the origin and exact meaning of the word Cameo, and Ducange, Lessing, and others have quoted various ways of writing it. In the language of art the term is usually applied to gems or stones that are worked in *rilievo;* that is, in which the object represented is raised above the plane of the ground, in contradistinction to INTAGLIO, in which the subject is engraved, or indented; strictly speaking, it refers to such stones only as have strata or grounds of different colours.

The art of engraving stones is of high antiquity: but it was for the most part confined to *intaglio*, or indenting, a simpler and an easier process than relieving the work from a ground; and as such stones were used for signets or seals in very remote ages (*Exod.* xxviii. 11. 21, &c.), the intaglio mode of working seems to be the most natural as well as the best adapted to the purpose.

It has been supposed that the Etruscans had the art of engraving hard stones before it was known to the Greeks; and from the forms resembling those of the *scarabæi* of the Egyptians, it has been thought that their knowledge was derived from Egypt. Many engraved stones however that are called Etruscan are doubtless early Greek, as may be inferred from their subjects, and from the occurrence in the inscriptions of characters of a Greek form.

The earliest Greek artist mentioned as an engraver of stones is Theodorus of Samos; Herodotus (iii. 41) tells us that the famous ring of Polycrates 'was the work of Theodorus, the son of Telecles the Samian.'* The first name of very great note that occurs in this branch of art is that of Pyrgoteles, who lived in the time of Alexander the Great, and who alone was permitted to engrave the portrait of Alexander. Tryphon deserves mention also in this place, being the author of a beautiful and well known cameo in the Marlborough collection, representing the marriage of Cupid and Psyche. He is supposed, on good authority, to have lived under the immediate successors of Alexander in Macedon.

The age of Augustus is remarkable for the excellence of the gem-engravers who were then living. Among these Dioscorides, or more correctly Dioscourides, held the highest rank. He seems however to have worked chiefly in intaglio. Some of his productions have reached our times, and prove that the estimation in which he was held was not undeserved. Dioscorides was under Augustus what Pyrgoteles had been under Alexander. From Augustus down to Marcus Aurelius there were engravers of gems, both in cameo and intaglio, of very distinguished merit. They were chiefly Grecian artists who settled in Rome. There were however some Roman gem-engravers who held a respectable rank, but the list is not considerable.

The Greek artists preferred representing the naked figure, and the finest works produced in Greece are seldom draped; while those executed in Rome, whether by native or by Greek artists, are for the most part clothed. Dioscorides continued to follow the taste of his own nation, and all his figures, with the exception of a Mercury in the cabinet of France, are believed to be naked.

It is impossible to describe works of this sort, containing so much fine detail, with sufficient accuracy to convey a just idea of their merits. They must be seen, and examined with care, to be properly appreciated, but it may not be amiss to notice a few of the most celebrated camei that are preserved in the museums of Europe. One of the finest is the Apotheosis of Augustus, in the collection at Vienna. It represents Augustus, his wife Livia, as Rome, accompanied by her family, with Neptune and Cybele; another is of an Imperial Eagle; also a Ptolemy and Arsinoe, &c. &c. In the French collection the sardonyx of Tiberius is one of the best known: it exhibits the Apotheosis of Augustus and the princes of the house of Tiberius; a Jupiter Ægiochus is a very fine specimen: to which may be added the Apotheosis of Germanicus; and one of Agrippina and Germanicus; with others, particularly some portraits of great interest. We possess in this country some camei of first-rate excellence, but they are chiefly in private collections. The whole of the above are also remarkable for the different strata or zones of colour which they exhibit.'

The antients were fond of decorating their drinking-cups with precious stones and *camei*. They called such vessels 'gemmæ potariæ.' Many of them are preserved in the cabinets of the curious. They are usually of sardonyx.

The workers in cameo not only exercised their skill in the cutting or engraving, but also in so arranging their subject and the composition of its details as to make the different colours or zones of the stones answer for parts of the design; as, for example, in relieving fruit, flowers, or drapery in colour, while the other parts, as the flesh of a portrait or figure, were left white; or cutting the subject entirely in white, and working no deeper into the stone than the first layer of colour; thus making, or rather leaving, a natural dark back-ground for the design. These irregularities or accidents are sometimes taken advantage of so skilfully, that it is very difficult to decide whether the variety is the effect of art, or really the natural colour of the stone.

The antients were so partial to this variously-coloured work, that they even imitated the material, in glass, and we possess in this country one of the most beautiful specimens of their ability in the Barberini, or as it is commonly called the Portland Vase, now in the British Museum. The ground is of a rich and deep blue, while the subject, consisting of several figures in low relief, is of a tender and semi-transparent white colour. As a work of art its execution is of the very first quality. This celebrated vase was discovered in the sixteenth century, in a sarcophagus in the tomb of the Emperor Alexander Severus and his mother Julia Mammæa, on the road from Rome to Frascati, and was for more than two centuries in the Barberini Palace at Rome. It then fell into the hands of Sir W. Hamilton, from whom it was purchased by the duke of Portland. It is believed to be the only perfect specimen of the kind existing; other cabinets possess examples of it, but they are only in fragments.

At the decline of the Roman empire gem-engraving fell with the other arts, and it was not till a late period that the taste and munificence of the Florentine family of Medici caused its revival in Italy, and tempted artists to devote themselves to its practice. It was much encouraged in the fifteenth century. The wealthy required such works for ornamenting their dress, for inlaying and embossing vases, and similar display; and as objects in *rilievo* had a richer effect than others, cameo-collecting became a passion in Italy. Vasari and Mariette may be referred to as the historians of the Italian gem-engravers of that period: and the fifteenth and sixteenth centuries will be found to boast several very distinguished artists in this class. In the succeeding century there was a considerable falling off, but in the eighteenth the art again rose, and the names of some who exercised it will bear comparison with those of almost any age. The greater part of these were Italians, but two of the most celebrated were natives of Germany, and are justly entitled to particular commemoration. The works of John Pickler and Laurence Natter challenge competition with the finest antiques. Natter has left a valuable work on his art, entitled 'De la Méthode Antique de graver en Pierres fines,' &c. Raspe's 'Catalogue of Tassie's Gems' may also be consulted with advantage by those who desire to extend their knowledge on this subject.

The practice of working camei on shells, *conchylie*, is of comparatively modern introduction in Italy; but it is now carried to so great an extent, in Rome particularly, and exercised with such success, that we feel fully justified in including it in our notice of the art; and we may even express the hope that it may be more practised by our own gem-engravers. The subject is worked in *rilievo* in the white portion or outer crust of the shell, while the inner surface, of a pink or reddish-brown tint, is left for the ground.

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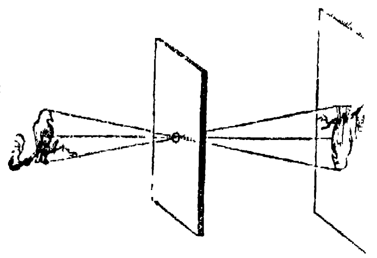
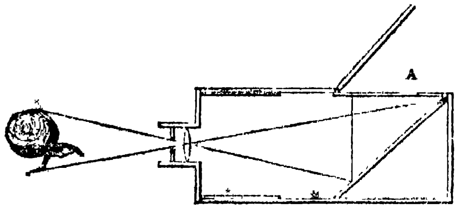
* [illegible] of this name, one of whom lived about 700 B.C., (Sillig. Cat. Artif.)

The art has never been sufficiently encouraged in this country to lead any great number of artists to pursue it exclusively; but England has notwithstanding produced a few eminent gem-engravers, and the names of Marchant and Brown particularly deserve honourable mention. Some artists of the present day also bid fair to carry the art to a high degree of perfection.

CA'MERA LU'CIDA and CAMERA OBSCU'RA, the light and dark chamber, a name given to two methods, very like in principle, of throwing images of external objects upon a plane or curved surface, for the purpose of drawing or amusement. In the first contrivance there is no *chamber*, but as it was the last invented, and as its predecessor had been called *camera obscura*, it was called *camera lucida*.

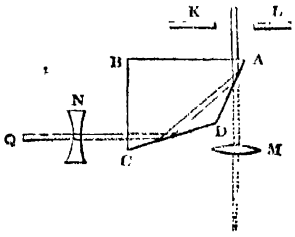
The earliest description of the camera obscura is in the seventeenth book of the *Magia Naturalis* of John Baptista Porta, who directs [illegible]ake a small aperture in the shutter of a perfectly dark [illegible]m, and to let the light fall upon a white screen or wall. It is evident that in this way inverted images will be obtained, the magnitude of which will depend upon the distance of the screen from the aper-[illegible] Porta makes one more step towards the present in[illegible]t. He states as a secret which he had concealed [illegible] then, and had intended always to conceal, that if a [illegible]vex glass be applied to [illegible]rture, all external objects [illegible] be seen as clearl[illegible] a bystander, with so much pleasure that those who see it can never enough admire it. He does not appear to have found out that the screen should be curved, in order that the points of convergence of all the pencils should fall exactly upon it. The present form of the camera obscura is as follows:—The box in the diagram has a tubular lateral opening which should, if the lens be large, be partly closed by a diaphragm to diminish the effective aperture. The rays passing through the lens from a distant object are prevented from converging by meeting a mirror inclined at 45° to the bottom of the box, and are thus made to converge at or very near to the glass plate A, one side of which is ground. A shade over the glass plate excludes direct light from falling on it. The under side of the glass plate should be curved; but, generally speaking, the aperture is so small that this is of little consequence, the trivial purpose of the apparatus being considered. The tube in which the lens is placed is made to slide, so that it can be adjusted to near or distant objects. The instrument being adjusted, the landscape directly in front of the object-glass will be painted on the glass A and not inverted, but only the right side on the left, and *vice versâ*. Sir D. Brewster (*Optics*, [illegible]net *Cyclopædia*) remarks that he has found advantag[illegible] using the silver back of a looking-glass smoothed with [illegible] as a mirror, and a film of milk dried on a plate of glass instead of ground glass.





The camera lucida is an invention of the late Dr. Wollaston. It depends upon the phenomenon [REFRACTION] that when light is attempted to be thrown into a rarer medium from a denser at more than a certain angle, depending upon the two media, none will pass through, but all will be reflected. The following is the description of Dr. Wollaston's apparatus; modifications may be found in Coddington's 'Optical Instruments' and the treatise of Sir D. Brewster, already cited. We omit detail of fittings and adjustments.

A B C D is the section of a glass prism, having an angle A D C of 135°. This is presented to the object in question in such a way that the pencils of rays proceeding from it fall on the surface C D at an angle of 45° or nearly so, and therefore, by the preceding principle, are reflected on A D, and again from A D to the eye, through an opening K L, which excludes all except the end of the prism at A, and a part of the sheet of paper or other flat surface G H. Hence the image of Q is thrown towards the visible part of the paper, and the eye viewing both the image and the sheet of paper (with different parts of the pupil, however, which creates a difficulty in using this instrument) the observer is enabled to trace the object upon the paper by means of one of the following adjustments:—



1. If Q be very distant, so that the rays of the pencils are nearly parallel, those rays will emerge nearly parallel, or the image will be at about the same distance beyond G H in appearance as the object Q is beyond B C. But the image must appear to be thrown *upon* the paper, or it cannot be distinctly traced. Either therefore the image of the paper must be removed to that of the object, or that of the object must be brought up to the paper. For long-sighted people, or those who see objects best at a distance, the first is most advantageous. It is done by placing a concave glass M, the principal focus of which shall be in or near the paper.

The consequence is, that the pencils from the points of the paper are rendered nearly parallel, and by an adjustment for raising or lowering the lens the image of Q may be made to appear to coincide with that of the paper. But for short-sighted persons, who require near objects or divergent rays, the end may be answered by employing, instead of the convex lens at M, a concave lens at N, which makes the rays of the image diverge, and by adjustment of which they may be brought to appear as pencils diverging from the paper. Mr. Coddington has remarked that this lens must produce an unnecessary distortion of the image, and that a short-sighted person had better use the convex lens at M, in the manner of a long-sighted person; using spectacles, or placing a concave lens at K L, to bring the images nearer, or to render the rays more divergent.

2. When the object Q is near the prism, the latter is raised or lowered on its pillar until the paper and the object are at equal or nearly equal distances from the prism. The image of Q will then be thrown on the paper without any necessity for a lens.

The camera lucida thus described presents the objects direct, and without reversal of left and right; but it is by no means an easy instrument to use. There is what is called a knack, which some can acquire, and some cannot. But every one can use the camera obscura.

A camera obscura for exhibition is generally made in a room with a conical roof and an aperture at the top. Above this aperture is a revolving plane mirror inclined at 45°, and reflecting pencils downwards. A convex lens causes these pencils to converge upon a surface of plaster of Paris, properly curved. The mirror revolves about a vertical axis, thus allowing all the compass-points of a [illegible]scape t[illegible] successively thrown on the surface.

On these toys we must observe that they are *artificial eyes.* The rays are collected by a lens or prism, and are then made to paint images on a surface, which answers to the retina. Or conversely we may say that, in the common experiment of cutting away part of the eye of a dead animal to show the images on its retina, the eye thus employed is converted into a camera obscura.

CAMERA'RIUS, JOACHIM, was born at Bamberg in 1500, studied at Leipzig, and became a great friend of Melancthon and other reformers. The duke of Würtemberg gave him the direction of the new University of Tübingen. In 1541 he was charged by Henry duke of Saxony with reforming the University of Leipzig, of which he was afterwards appointed rector. In 1568 the Emperor Maximilian, who had called him to Vienna to consult him about some important state-affairs, wished to retain him as his councillor, but Camerarius declined the offer on account of his infirmities. He died at Leipzig in April, 1574. Camerarius was one of the most distinguished scholars of the age of the Reformation. The following are his principal works:— 1. 'Libellus Scholasticus,' containing maxims and precepts from Pythagoras, Phocylides, Solon, and extracts from Tyrtæus, Simonides, Callimachus, &c. 2. 'Narratio de H. Eobano Hesso,' including biographical notices of several other learned men of the same age. 3. 'Vita Philippi Melanchthonis,' a good biography of that distinguished reformer. 4. 'De rebus Turcicis Commentarii duo.' 5. 'Historia Synodi Nicenæ.' 6. 'Notica sive de Ostentis lib. duo.' 7. 'Vita Mauritii Saxoniæ Electoris.' 8. 'De Divinationum Generibus.' 9. 'De Numismatibus Græcorum et Latinorum.' 10. 'Philosophicæ Consolationes,' written by him and Sadoletus united. 11. 'Historica Narratio de Fratrum Orthodoxorum Ecclesiis in Bohemia, Moravia, et Polonia;' besides numerous translations from and commentaries on Cicero, Aristotle, Sophocles, &c. Camerarius was an excellent horseman, and he wrote a work on the art of training horses, 'Hippocomicon,' which enjoyed considerable reputation. The 'Epistolæ,' or correspondence, were published after his death by his son Joachim in two vols. Frankfort, 1583–95. Camerarius' eldest son, John, became a councillor of the duchy of Prussia. His second son, Joachim, was a distinguished physician, and has left several works on medicine and botany. His third son, Philip, while travelling in Italy, was arrested by the Inquisition at Rome, but was afterwards released, and on his return to Germany became vice-chancellor of the new University of Altorf. He wrote 'Horarum subsecivarum Centuriæ tres,' 3 vols. 4to. Frankfort, 1624, a work often reprinted.

CAMERONIANS, a religious body, so called from the Rev. Richard Cameron, a non-conformist preacher, who was killed with others in a conflict at Airdsmoss in the shire of Ayr, on the 20th July, 1680, in the maintenance of their doctrines. They are otherwise called 'M'Millans,' from the name of the first minister who espoused their cause after the Revolution. But these, as well as the terms 'Whigs' and 'Mountain men,' which are also occasionally applied to them, they regard as accidental epithets. They are sometimes also called 'Covenanters,' from their adherence to the national covenant of Scotland, and the solemn league and covenant of the three kingdoms. Their proper designation however is that of 'Reformed Presbyterians,' or, particularly in Scotland where they had their origin, 'Old Presbyterian Dissenters:'—*presbyterians*, as holding the leading doctrines maintained by Calvin and his followers; *dissenters*, as separatists from the Church of Scotland; and in the adjective *old* we are carried back to their origin and first rise.

It was at the Revolution that this little shoot sprung from the great branch of Calvinist reformers. The arbitrary measures of the crown, which led to that important change, roused into activity a spirit of liberty which thrilled through every part of the community. The religious feelings of the people were in a particular manner excited; and among others Cameron, the preacher above mentioned, asserted with great freedom and boldness the independence of the church. His doctrines were not more obnoxious to the government than his zeal in asserting them was dreaded by his brethren of the clergy, and in 1677 the latter formally met at Edinburgh and reproved him for his conduct. To divert his mind under the painful impressions which his promise on that occasion afterwards gave him, he retired to Holland, whence however he soon returned, and on the 22nd June [illegible], in company with about twenty other persons of the same sentiments with himself, well armed, entered the little town of Sanquhar, in Dumfries-shire, and at the market-cross there proclaimed, in a ceremonious manner, a declaration, that Charles Stuart (meaning the king), although descended from the race of their antient kings, had by his perjuries in the breach of his covenanted vows, his tyrannical government, and his usurpation over their civil and religious liberties, dissolved the allegiance and forfeited all right and title to the crown. The party kept together in arms for a month in the mountainous district between Nithsdale and Ayrshire; but at length, on the 20th July, while lying at Airdsmoss in Kyle, they were surprised by a large body of horse and foot under the direction of the government, and in the short skirmish which followed, Cameron was killed, and his followers were dispersed or taken prisoners. Among the former was Cargill, who continued to preach the doctrines of the sect in the fields; and in September following, at a conventicle held in the Torwood, between Falkirk and Stirling, pronounced a solemn excommunication against the king and his brother the duke of York, the dukes of Monmouth, Lauderdale, and Rothes, the lord advocate, and General Sir Thomas Dalzell of Binns, for their exertions against the supremacy of the pure church of Scotland, their perjury in reference to the covenant, and their cruelty and oppression towards the people of God. To these acts of the royalists was soon afterwards added the Test of 1681, against which the covenanters published their testimony at Lanark on the 12th January, 1682, adhering to and confirming the Sanquhar declaration, and giving reasons at length for their disowning the king's authority. This they again did, and declared their firm resolution of constant adherence to the covenant, in their Apologetic Declaration of 28th October, 1684; and on the accession of James duke of York to the throne, they published another declaration at Sanquhar on the 28th May, 1685, wherein they renewed their previous declarations, and further protested against the accession of the duke of York, as a professed and excommunicated papist, and against popery itself in all its heads, as abjured by the national covenant. In these circumstances, it is plain the Revolution was an event which they would hail in common with the other Presbyterians, but the latter acquiesced in arrangements with the government into which the former refused to enter; and they have since continued to testify against the Revolution settlement, as they now also do against the Articles of Union, the Toleration Acts, the conduct of the church, and generally, all association whether of church or state with those who do not adopt the principles of Scripture, the Reformation, and the covenant.

They hold the Holy Scriptures to be the absolute rule of faith and conduct, and to contain the standard of these both in church and state. Next to this they adopt the early standards of the church of Scotland, the Westminster Confession of Faith, the larger and shorter catechisms of the church, the books of discipline, and the Westminster Directory for Public Worship. And lastly, they regard the national covenant of Scotland as a continuing obligation. To these are to be added the documents published by the body itself in explanation of their principles, namely, their 'Judicial Act and Testimony,' the 5th edition of which was published at Glasgow in 1818; 'A short Account of the Old Presbyterian Dissenters,' published by authority of the presbytery in 1806; and an 'Explanation and Defence of the Terms of Communion adopted by the Reformed Presbyterian Church,' editions of which two latter were printed at Glasgow in 1824.

The religious body we are now considering was formed into a presbytery on the 1st of August, 1743, under the title of the Reform Presbytery. In Scotland, till lately, they had no higher ecclesiastical judicatory than a presbytery. They have now a synod, consisting of the Edinburgh, Glasgow, Paisley, Kilmarnock, and Newton Stewart presbyteries. The number of churches is 33, six of which however have at present no fixed minister. The number of joined members is estimated at 6000. In Ireland there is a synod of four presbyteries, and the congregations are 27 in number; and the joined members are stated at 7000. In England there are two congregations, one with an ordained minister, the other vacant. In Nova Scotia and New Brunswick there is a presbytery of two ministers. In Canada there is an ordained missionary in connexion with the Scottish synod; and in the United States there are about 60 ministers and as many congregations. In the United States there is this peculiarity, that no slave-holder is admitted to communion.

CAMILLUS, MARCUS FURIUS, a celebrated Roman, who lived about the middle of the fourth century after the foundation of the city. There is so much of the fabulous in all that is told about him that one might very reasonably suppose that Livy and Plutarch have derived the traditions respecting this warrior from some old poem. (Niebuhr, *H. R.*, vol. ii., p. 47[illegible].) That there was such a person, and that his actions entitled him to the gratitude of his countrymen, cannot, we think, be doubted, and even Niebuhr has not attempted to deny him the personality which he is unwilling to concede to Romulus and Coriolanus. (*H. R.* ii., [illegible] 501.) Camillus was created dictator five times, and triumphed four times, but never served the office of consul. (Plutarch, *Camill. init.*) This was principally owing to the substitution of the military tribunate for the consulship in the early part of his life. His first dictatorship was in the 10th year of the siege of Veii, which was taken by him probably by means of a mine, by which part of the wall was overthrown. (Niebuhr, *H. R.* ii., p. 481, who has sufficiently refuted the ordinary tradition.) He also conquered the Faliscans, who, according to the legend, yielded unconditionally to him in consequence of his generosity in restoring to them their children whom a traitorous schoolmaster had delivered into his hands. (Plutarch. *Camill.* x.) He was impeached, in A.U.C. 364, by the tribune L. Apuleius, on a charge of peculation in the distribution of the plunder of Veii, and his guilt was so manifest that even his own clients could not acquit him. (Liv. v. 32.) Camillus retired to Ardea, and lived there as an *inquilinus* till the battle of the Allia and the capture of Rome: he then took up arms for his country, and led the Ardeates against the Gauls, over whom he obtained some advantages. At length the people, sensible of the necessity of his recal, restored him to his civic rights by an ordinance of the plebs passed at Veii, and after two battles, the one fought in the city and the other on the road to Gabii, he completely exterminated the invading army. It was probably owing to his influence that the Romans were induced to rebuild their own city in preference to migrating to Veii, as many wished to do, and for this and his other services he was called the second Romulus. In his fourth dictatorship he had some more disputes with the plebeians, in consequence of which he abdicated his office. (Liv. vi. 38.) He died of the plague in the year of Rome 390. (Liv. vii. 1.; Plutarch. *Camill.* xliii.) His son and brother were also eminent men, but with these exceptions no one his family, according to Tacitus (*Annal* ii. 52), obtained litary renown till the age of Tiberius, when Furius Camillus, proconsul of Africa, triumphed over the Numidians. The son of this Camillus raised a rebellion in Dalmatia in the reign of Claudius, and proclaimed himself emperor, but in a few days his soldiers returned to their allegiance, and Camillus committed suicide.

CAMOENS (Dom Luis de Camões), called the Homer and Virgil of Portugal, for his celebrated poem of the 'Lusiad,' was born at Lisbon; but Coimbra and Santarem have disputed this honour with Lisbon. There is no less controversy about the precise year of his birth, which, according to some, was 1517 while most biographers suppose it to be 1524.

His family was of considerable note, and originally Spanish. In his infancy, his father, Simon Vas de Camoens, commander of a vessel, was shipwrecked at Goa, and lost, with his life, the greater part of his fortune. His mother, however, Anne de Macedo, of Santarem, was enabled to give her son such an education as qualified him for the military service and for public life. Camoens was sent to the university of Coimbra, where, notwithstanding Voltaire's rash assertion that his youth was spent in idleness and ignorance, it appears from his works that he must have acquired the substance as well as caught the spirit of classical learning.

On quitting the university Camoens returned to Lisbon. His prepossessing appearance and great accomplishments, added to his love of poetry and gallantry, which now engrossed all his thoughts, soon made him an object of public notoriety, especially as the charms of Catharina d'Atayada, a lady of honour (dama do paço) at the court, had captivated his heart. This amour with a lady above his rank was the origin of the long series of Camoens' calamities. He experienced the fate of Ovid, with whom he compares himself in his third elegy, written at Santarem, the place of his exile and retirement, where he also began his 'Lusiad.' Camoens soon became tired of an inactive and obscure life. To be at once a hero and a poet was his ambition. He joined, as a volunteer, an expedition which John III. was then fitting out against the Moors of Ceuta, and greatly distinguished himself in several encounters. In a naval engagement with the Moors in the Straits of Gibraltar he was among the foremost to board, and lost his right eye in the conflict. This he relates himself in his Cançao x., stan. 9.

Hoping to deserve as a soldier that reward which he had failed to obtain as a poet, he returned to Lisbon; but no friend seconded his efforts at court to gain even an honourable competence. Other biographers say that he was recalled to court owing to the great military reputation which he had acquired, but that he was once more driven away by that jealousy which still dreaded his poetic gallantry, and his attentions to the ladies of the palace, though his countenance had been so sadly marred. Baffled in all his expectations, he determined to leave his native country; and accordingly he embarked in 1553 for India, in search of better prospects, or, at least, an honourable grave for his misfortunes. As the ship left the Tagus he expressed his resolution never to return, in the words of the sepulchral monument of Scipio Africanus,—*Ingrata patria, non possidebis ossa mea.*

From this moment fate seems to watch over Camoens in all his harassing adventures and frequent dangers, in order that he might complete, as it were, his poetic career. He arrived at Goa, in one of the four ships which sailed to India, after seeing the other three perish in a storm. Not being able to find employment at Goa, he immediately joined as a volunteer a Portuguese expedition, which was ready to sail in aid of the king of Cochin against the king of Pimenta. Although a great portion of his countrymen were carried off by the insalubrity of the climate, Camoens returned safe after he had displayed his usual bravery in the conquest of the Alagada islands. In the following year he accompanied Manuel de Vasconcello in another expedition to the Red Sea, against the Arabian Corsairs. At the island of Ormuz, in the Persian Gulf, where he passed the winter, his imagination gave a poetic colouring to the scenery of that spot, and to the Portuguese achievements in India. He visited also mount Felix, and the adjacent part of Africa, which he so strongly pictures in the 'Lusiad,' and in one of the little pieces in which he laments the absence of his mistress. Unfortunately for him he indulged also in satire, and exposed in his 'Disparates na India' (Follies in India) some of the government proceedings at Goa. The viceroy immediately banished him to the island of Macao. Soon after he obtained leave to visit the Moluccas, where he collected fresh materials for pictorial poetry; but he could no longer, as the lines beneath his portrait express, 'bear in one hand the sword, in the other the pen,' and he was glad to accept the very unpoetic post at Macao of *provedor-mor dos defuntos* (administrator of the effects of deceased persons), by which employment he was rescued from destitution, and even enabled to make some savings. Having received permission from a new viceroy to return to Goa, he was shipwrecked in the passage on the coast of Cambodia. He saved, on a plank, and with great difficulty, only his life and his poems.*

Camoens had not long enjoyed repose when a new viceroy, lending a ready ear to his enemies, who accused him of malversation in his office at Macao, threw him into prison. Although he cleared himself of the charges, and loaded his enemies with ignominy, he was still detained for debts which he was unable to satisfy; but a poem, at once witty and affecting, which he addressed to the viceroy at length procured his liberation. Resuming the profession of arms, he accompanied Dom Pedro Barreto to the distant and barbarous settlement of Sofala. A ship bound homeward having touched at this place, his former resolution was shaken, and he determined to return to Europe. Barreto endeavoured to prevent the embarkation of Camoens by charging him with a debt for board. Anthony de Cabra, however, and Hector de Sylveira, paid the pitiful demand; and thus Camoens and the honour of Barreto, says Faria, were discharged together. Finally, Camoens, after an absence of nearly sixteen years, arrived in 1569 at Lisbon, in the most abject poverty, his poems being the only treasure and last hope which he had brought from the rich shores of India. More ill-fated still at the end of his career, he found his native city ravaged by the plague, and during such a calamity poetry could avail him still less than ever. King Don Sebastian was then concerting the plan of his unfortunate expedition to Marocco, and this induced Camoens to dedicate his poem to the youthful monarch. Although the dedication was graciously received, it was only rewarded with a wretched pension, just sufficient to mark but not to relieve the misery of its author.

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* He mentions this shipwreck in his Canto X., stan. 128. The story, however, of his swimming ashore with his poem in one hand, while he supported himself by the other, and thus saved his 'Lusia[illegible]aved his 'Commentaries,' has obtained currency through the sta[illegible]h German writer, who seems to have misunderstood Barbosa Mach.

It appears that Cardinal Henry, who succeeded Sebastian, withdrew that small pension. He patronized only what was called learning by the monks and friars, whose pious forgeries and miracles he highly valued. This bigot was the persecutor of George Buchanan, and the patron of the inquisition, of which he extended the horrors even to Goa. Under his weak and wicked hands the kingdom fell into utter ruin.

When we find Camoens exhorting, in his poetic and prophetic zeal, young Sebastian to exclude the clergy, by which he means, in the first instance, Cardinal Henry, from state-affairs; when we look to the man of genius, neglected by his monkish contemporaries, yet, in his old age and misfortunes, lamenting less for his own fate than for the approaching ruin of his degenerate country; Camoens, with these worthy sentiments and this unworthy destiny, commands an elevated and respectful sympathy. It is not merely the old man, or even the neglected man of genius, dying in an hospital,—it is the patriot and the patriot-bard, —the hero and the soldier,—the friend of truth, as well as the great master of fiction,—ennobling even his death upon a flock bed, by those sentiments which deepen, by contrast, the disgrace and degeneracy of his country. 'I am ending (he says in one of his letters) the course of my life: the world will witness how I have loved my country. I have returned not only to die in her bosom, but to die with her.'

The fate of Camoens throws great light on the history of his country, and appears strictly connected with it. The same ignorance, and the same degenerate spirit which suffered Camoens to starve, and to depend only on the sympathy of a foreign and aged servant,[*] and finally to die most wretchedly in an hospital, sank Portugal into the most abject vassalage ever experienced by a conquered nation. While the grandees of Portugal were blind to the ruin which impended over them, Camoens beheld it with a pungency of grief which hastened his end, in 1579, the year after the fatal issue of the African expedition under King Sebastian, at the battle of Alcaçar.

Camoens attempted every style of poetic composition of which he had formed a definite idea, but the 'Lusiad' rises so far above his other works, that all his numerous but lesser compositions must be considered as inferior scions sprung from the same root. The 'Lusiad' is an heroic poem which differs from all others of the epic class. Camoens struck out a totally new path in the region of epic poetry.[†]

His object was to recount in epic strains the achievements of the great men of Portugal in general, not of any individual in particular, and, consequently, not of Vasco de Gama alone, who is commonly considered the hero of the 'Lusiad.[‡]' The very title he gave it, *Os Lusiadas* (the Lusitanians), denotes at once the true nature of its subject. An epic grouping of all the great and most interesting events in the Portuguese annals forms the whole plan, and the discovery of the passage to India is the groundwork of the epic unity of the poem, but Vasco de Gama is merely the spindle round which the thread of the narrative is wound. The 'Lusiad' has no real episode except the short story of the giant Adamastor. Unless the idea of the plan of the 'Lusiad' be rightly seized, the composition will appear in a false light on whichever side it is viewed. Designated as a whole, it may therefore be termed an epic national picture of Portuguese glory, greater however than a mere gallery of poetic stories, but less than a perfect epic. The unity of interest and effect, and consequently of the poem, rests wholly and solely on the execution of the plan, out of which only a poet like Camoens could have created a 'Lusiad.'

His talent in picturesque comparison was formed on the model of Ariosto more than that of Homer. His description of Venus, who once more intercedes with Jupiter, resembles Ariosto's description of Alcina. The first idea of his Island of Love seems borrowed from the same writer. There is, however, little room to doubt that Tasso, when he trod in Ariosto's footsteps in order to describe the abode of Armida, availed himself of the description of Camoens,[*] as afterwards the garden of Armida furnished Spenser with his 'Bower of Bliss.'

Among the most beautiful passages of the 'Lusiad' are enumerated[†] the tribute to the memory of Egas Moniz, the Portuguese Regulus, who, however, ended his career more happily than the Roman consul; the description of the battle of Ourique, which laid the foundation of the kingdom of Portugal; the description of the visit of Queen Maria of Spain to her father the king of Portugal, to implore assistance for her husband in his contest against the Moors; the relation of the tragical fate of Ignez de Castro, which is the most celebrated of all the exquisite passages of the 'Lusiad;' the description of the sanguinary battle of Aljubarrota, the greatest victory the Portuguese ever gained over the Castilians; and some others of the like character, which might also be enumerated.

Camoens has left, besides the 'Lusiad,' specimens of no common merit in every style of poetry written in Portugal in his time; 301 of his sonnets which have been preserved exhibit his prolific fancy, and some of them all the tenderness and grace of Petrarch. His 17 'Canções' (songs) prove still more particularly how deeply he was penetrated with the spirit of Petrarch's poetry. The 12 odes which follow approximate more nearly to the classical style, and the first, addressed to the moon, begins in the pure ode style, and is particularly distinguished for its beauty. In his 'Sextinas' Camoens has not failed in rendering their artificial ornaments pleasing. But his 21 elegies are more worthy of attention; they are, in general, the longest poems of the collection next to the 'Lusiad' and the 'Creation.' Some were written in his youth and in exile, others during his oriental voyages and adventures. No other works of the poet so irresistibly command the reader's regret for his misfortunes, and love for him as a man.

A few poems widely differing from each other are printed under the common title of 'Estancias' (stanzas), because they are all composed in Italian octaves. The three first of the series are truly poetic epistles and faithful mirrors of the character and principles of the author.

Among the miscellaneous poems of Camoens the eclogues occupy a considerable space. They have more the form than the spirit of pastoral poetry. Passages in Spanish are occasionally interspersed with the Portuguese.

In the collected works of Camoens a separation is made of his poems in the Italian style and the Italian syllabic measure from those which are composed in *quintilhas*. In this style also he has enriched every species of poetic composition then known in Portugal and Spain. The *redondilhas* on his return from Macao to Goa, after he had narrowly escaped death by shipwreck, are among those best known.[‡]

Romantic, gallant, and comic effusions of fancy and wit (*glosas* in the Spanish style, *voltas* in Portuguese), and other poetic trifles in the Portuguese and Spanish languages, appear to have been dealt out at every opportunity with a profuse hand by Camoens, and no mental sport seems to have been too homely for him.

Finally, to leave no kind of poetical composition unattempted, he wrote (probably previous to his departure for India) three dramas: 'El Rey Seleuco' (King Seleucus), 'Os Amphitryões' (The Amphitryons), and 'Filodemo.' Had the genius which animates the 'Lusiad' taken a dramatic direction, Camoens would have been the Calderon of Portugal before a Lope de Vega had arisen in Spain.

A very good edition of the works of Camoens appeared at Lisbon in 1779-80, under the title of 'Obras de Camoens, Principe dos Poetas de Hespanha,' 4 tom. 12mo. A second edition also appeared in 1782-83 in five small volumes, the first of which contains the life of the author and the 'Lusiad,' and the last the dramatic and other pieces ascribed to Camoens. A most correct, splendid, and now rare edition of the 'Lusiad' was published, with very fine engravings, in one vol. 4to., by Firmin Didot at Paris in 1817, the expense of which was defrayed by Souza Botelho. In this edition, of which very few copies were printed, the original text has been restored with great accuracy. P. Didot, sen., had published previously a 'Lusiad' in 12mo.

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[*] He had a black servant who had grown old with him, and who had experienced his master's humanity. This grateful Indian, a native of Java, who, according to some writers, had saved his master's life in the shipwreck where he lost all his effects—this Indian, grown old and white-haired in his service—begged in the streets of Lisbon for the only man in Portugal gifted with those talents and that spirit which alone can raise and restore the spirit of a sinking nation.

[†] The apology for Camoens which precedes Mickle's version of the 'Lusiad' defeats itself; for the English translator makes the Homeric epic his standard, and in order to justify the 'Lusiad,' misconstrues the machinery of the 'Iliad.' Mickle however is the only translator who has represented the elegant dignity of Camoens's style. He has exposed, moreover, several glaring instances of ignorance and misrepresentation in Voltaire's critique on the 'Lusiad.'

[‡] Nuno Alvares, who saved the political existence of Portugal at the battle of Aljubarrota, might, with more propriety, be denominated the hero of the 'Lusiad.'

[*] The first edition of the 'Jerusalem Delivered' appeared in 1580, a year after the death of Camoens. The 'Lusiad' was printed in 1572, the pestilence at Lisbon having prevented its appearance for three years. Tasso read it, and praised the author in a sonnet, which has been preserved.

[†] By Bouterwek, in his 'History of the Spanish and Portuguese Literature.'

[‡] Standing friendless on the banks of the Mecon, in Cambodia, he composed that beautiful paraphrase, so celebrated by Lope de Vega, of the 137th psalm, where the Jews, in the finest strain of poetry, are represented as hanging their harps on the willows by the rivers of Babylon, and lamenting their exile from their native land.

CAMOMILE. [Anthemis.]

CAMOUFLET, or STIFLER, in military mining, is a small charge of powder sunk in the wall of earth between two parallel galleries, in order, by blowing the earth into one of them, to suffocate or cut off the retreat of the miner who is at work in it.

CAMP. [Encampment.]

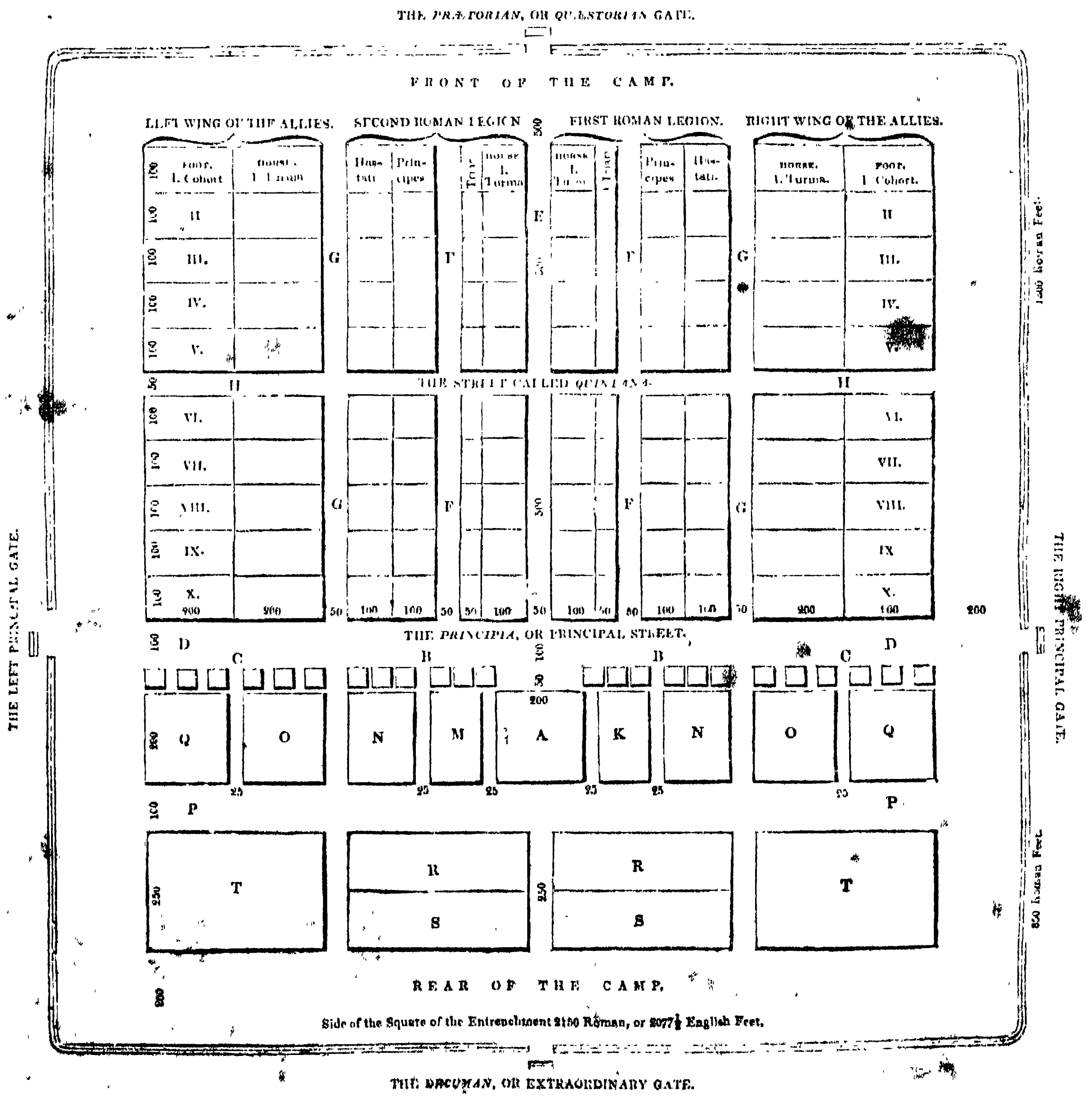
CAMP, ROMAN. There are few parts of the art of war as practised by the Romans in which the laborious and regulated carefulness of that sagacious people is more evident than in their system of castrametation. In the present article we shall give some account of the construction of their camps, and the arrangement of the troops in them.

In speaking of the Roman camps, it is necessary to distinguish between the summer and winter encampments (*castra æstiva et hyberna*); and again to discriminate between those camps which were formed to protect the army for a short period, and those which they proposed to occupy for a longer time which were called *castra stativa.* The difference between these consisted chiefly in the strength of the fortifications, and in the superior size of the temporary camps, which were intended commonly for the whole army, while the more permanent encampments were for divisions of the army. Winter encampments were not used by the Romans in the earlier periods of their history, when their chief wars were little more than summer campaigns, and were waged against neighbouring nations: but in a later age, when permanent conquest was their aim, and the war continued several years, the army was regularly distributed into winter-quarters, and often spread over a considerable extent of country, in order to overawe the subjugated districts, or because forage and provisions could be obtained by the army in several divisions more easily than when it was in one body. Cæsar in his Gallic campaigns regularly distributed his army into winter-stations so strongly fortified that though several attempts were made upon them only one was taken, and that because the commander unwisely abandoned it. (Cæs. *de Bel. Gal.*, lib. v.)

Perhaps the completest description which we have of a Roman camp may be found in Polybius, who has in the sixth book of his history given a pretty full account of the military tactics of the Romans, part of which, relating to their castrametation, we shall condense with the further information collected by General Roy. Polybius lived at a time when the institutions of the Republic were in their full vigour; he had gained military experience in the armies of his country; and his opportunities of acquiring information, both from personal observation and from the information of others, were ample.

When a place suitable for a camp had been chosen, the

Plan of the Polybian Camp of a Roman Consular Army.



first thing was to fix a standard on the spot judged to be most suitable for overlooking the army when encamped, and sending commands to the different quarters. Round this standard a square of 200 feet was measured, and set apart for the general's quarters: this was called *prætorium* (A), from the name *prætor*, which, according to early Roman usage, was the general title of a military commander. On that side of this square inclosure which was deemed most suitable for obtaining forage and water, the bulk of the army was encamped, and that side of the *prætorium* and the corresponding side of the camp, we shall follow Polybius in calling 'the front.' In front then of the *prætorium*, distant from it fifty feet, on a line running across the camp, were placed the tents and baggage of the legionary tribunes (B B), who in the ordinary consular army (of two Roman legions with the regular proportion of allies*) amounted to twelve: and towards either extremity of the same line were the tents of the *præfecti* (C C) or officers, who held among the allies a rank similar to that of the tribunes in the legions. These tents were pitched with their backs to the *prætorium*.

In front of the tribunes' tents, a passage, 100 feet wide, called in our plan the *Principia*, or *principal street* (D D), ran across the camp; and between the side of this passage and a line parallel to it, near the front of the camp, the soldiers were encamped in lines, which formed a right angle with the *Principia*. The soldiers' quarters were divided into two parts by a passage 50 feet wide (E), which ran from the *prætorium* to the front of the camp. On each side of this street were posted the Roman cavalry, and next to them the *Triarii*, one of the divisions of the legionary infantry. Next to these were two passages of 50 feet wide (F F F F), and then the *Principes* and the *Hastati*, the other divisions of the Roman infantry. The tents of each division fronted the passage next to them, so that when the tents of two divisions, as of the cavalry and the *Triarii*, and of the *Principes* and the *Hastati*, were not separated by an intervening passage, they had their backs to each other. There were in a legion ten *turmæ* of the cavalry, and ten *manipuli* of each division of the infantry; and the *turmæ* and *manipuli* of each division were encamped in one range along the passages, a quadrangular space of 100 feet square being allotted to each *turma* of cavalry, and each *manipulus* of the *Principes* and *Hastati*, while each *manipulus* of the *Triarii*, which had seldom more than half the complement of the other *manipuli*, had a space of 100 feet by 50.

Beyond the tents of the *Hastati* on each side was another passage of 50 feet wide (G G G G), and then came the quarters of the allied cavalry, and beyond these again, without any separating passage, the quarters of the allied infantry, whose tents looked toward the ramparts of the sides of the camp. The tents of the allies occupied a space of the same length as that occupied by the legionary soldiers. The depth of their quarters varied with the number of the men: our plan assigns to the cavalry and infantry an equal depth, viz., of 200 feet each: this is probably near the truth. The quarters of the legionary soldiers and the allies were alike divided into two parts by a passage 50 feet wide, called *quintana* (H H), running across the camp in a direction parallel to that of the *Principia*, between the fifth and sixth manipuli and turmæ.

The space on each side of the prætorium was occupied, the one side (K) by the *quæstor* (whose office combined the direction of the commissariat department and the care of the military chest) and the military stores, and the other side (M) by the *forum*, or place for holding a market and transacting business. Next to these on each side were the quarters (N N) of the chosen troops from the extraordinary cavalry of the allies, who served in the consul's body-guard, and of the volunteers (O O) who had engaged in the service from regard to the consul. The tents of these looked towards the *quæstor's* quarters and the *forum*. Beyond these on each side, with their tents fronting the rampart of the camp, were the chosen troops (Q Q) from the 'extraordinary' infantry of the allies, who also formed part of the consul's body-guard. Behind all these, right across the camp, ran a passage or street of 100 feet wide (P P); and beyond this passage, and parallel to it, were the quarters of the main body of the 'extraordinary' cavalry of the allies (R R); and behind these, looking towards the back of the camp, were the quarters of the extraordinary foot of the allies (S S). The flanks of these quarters (T T) were occupied by any foreigners or temporary reinforcements of allied troops which might be in the camp. Polybius does not assign any particular quarters to the *velites*, or light armed men.

The space occupied by all these quarters formed a square, and on every side was left an interval of 200 feet, which served for various useful purposes, to deposit the booty, to afford space for the troops to enter and leave their respective quarters, and to protect the tents and troops from fire or weapons thrown by any who might assail the camp from without. The whole was surrounded by a rampart (*vallum*) and a ditch (*fossa*), through which were four gates or entrances: the Prætorian gate (*Porta Prætoria*), in front of the camp, opposite the *prætorium*; the Decuman gate (*Porta Decumana*), at the bank of the camp; and a gate at each end of the *principia* or principal street.

If the two consular armies were united, the camp formed an oblong square, and resembled two camps placed back to back, without any intervening intrenchment. It appears to have had six gates, two prætorian and four others, one at each end of the two principal streets or passages.

The vallum was composed usually of earth or turf, sometimes of stones or wood, and was surmounted by a palisade. The ditch was on the outside. In stations which were designed to be permanent, and which were in a disturbed or hostile country, the works were constructed with unusual care, and there are many remains or vestiges of them in different parts of Great Britain. One of the most perfect is at Ardoch, in Scotland. [ARDOCH.]

The plan of a Roman camp, which we have given, is taken from General Roy's *Military Antiquities of the Romans in Britain*, to which we refer the reader for many valuable observations on the castrametation of the Romans.

CAMPA'GNA DI RO'MA, the most southern division of the Papal state, corresponds in great measure to the antient Latium in its later and more extensive sense, being bounded on the N.W. by the Tiber, which divides it from the Patrimonio di S. Pietro; on the N. by the Teverone or Anio, which divides it from the province of Sabina; on the E. by an offset of the Apennines, which divides it from the valley of the Garigliano or Liris in the kingdom of Naples, and which terminates at the sea near Terracina; on the S. and W. by the Mediterranean. The length of the province from Ostia to Terracina is about 62 miles, and its greatest breadth 45 from the Apennines to the sea. It is divided into two regions, the lowlands and the highlands, including the valley of the Sacco and part of that of the Teverone. The highlands consist of the E. Apennines; of the offset which divides the valley of the Teverone from that of the Sacco, the antient Trerus, and on which are the towns of Anagni, Palestrina, &c.; of the Monti Lepini (Volscorum Montes), which divide the valley of Sacco from the Pomptine marshes; and lastly of the Alban or Tusculan mounts, which rise in the middle of the plain, and separate the lowlands of the Tiber from the Pomptine marshes. Towards the N. the highlands of Alba and Tusculum are connected by some high ground towards Zagarolo with the mountains of Palestrina, thus separating the waters which run eastward into the Sacco and the Liris from those which run W. into the Tiber. The Apennines and the Monti Lepini are mostly rugged and bare; the valley of the Teverone is wholesome, and the population robust, though poor; the valley of the Sacco is wide, fertile, and well cultivated. The Alba and Tusculum mounts are covered with trees, vineyards, and gardens; the air is salubrious, and the soil in many places very fertile. Those who talk of the desolation of the Campàgna seem to have visited only the lowlands to the right and left of the high road between Rome and Naples, and that only in the summer months; for 'in the winter and early part of the spring you see fields and pastures decked in all the luxury of a spontaneous vegetation, numerous herds of cattle and flocks of sheep grazing on the rich grass; but as soon as the hot season comes, a sudden change takes place in the appearance of the country—vegetation ceases—first a yellow, then a grey tinge covers the ground—the dusty soil looks as if it were calcined by fire—the cattle migrate to the mountains—and the inhabitants disperse.' (Tournon, *Études Statistiques sur Rome*.) The lowlands of the Tiber, which form what is called l'Agro Romano, or the territory of the city of Rome, which extends on both banks of the Tiber, and which is often confounded with the Campágna, contain, according to Nicolai's good statistical work, 111,400 rubbi (a square measure of about four English acres), of which about one-half are arable land, the rest pasture and forest, and only 1500 rubbi are marsh. This territory is divided into about 400 tenute, or farms. (*Memorie sulla Campágna di Roma*, 3 v. 4to. 1803, with a good map of the Agro.) It is evident that it is not the marshy grounds that cause the unwholesomeness of this part of the country. The surface of the soil is in fact undulating and dry, and slopes gently towards the coast; the malaria must be attributed to other natural causes. In Sir Wm. Gell's *Topography of Rome and its Environs*, with an excellent map, which embraces a larger area than that of Nicolai, and in fact almost the whole province of the Campágna, with the exception of the Pomptine marshes, we find the following statement at the end:—'There are 242,000 rubbi of arable land, 82,000 of which are considered to be in healthy districts, and the rest, being unwholesome, are sown with grain only once in four or five years. Wheat returns about nine for one. The vineyards are 14,600 rubbi; pastures, 162,000 rubbi; orchards, 1400; woods and forests, 170,000: in all 590,000 rubbi, or 2,360,000 acres, besides rocks, sands, marshes, rivers, &c., which occupy about 145,000 rubbi more. There are 700,000 sheep, 100,000 horned cattle, 4000 buffalos, and 35,000 horses, besides pigs and goats.' This statement, which is taken from Marini's work on the Catasto, comprises, however, also part of the adjoining province of the Patrimonio di S. Pietro, on the right bank of the Tiber. The great plain between the S. slope of the Lepini and the sea, which is known by the name of the Pomptine marshes, extends from Torre Tré Ponti to Terracina, a length of about twenty-two miles by ten of breadth; of this extent only the lower tract, about 65,000 rubbi, is really marshy. Pius VI. drained 9000 rubbi which were constantly under water. Of the whole extent of the marshy ground, one-third is susceptible of cultivation; another third is in pasture, and the rest forest or marsh. The extent of the province of Campágna, including that part of the territory or jurisdiction of Rome which lies on the left or E. bank of the Tiber, is calculated at 2266 square miles, of which about one-half is unwholesome, and only inhabited by a permanent population of about 15,000. The whole province contains 259,800 inhabitants, exclusive of the city of Rome, which has a population of 152,000. (Calindri, *Statistica*, Neigebaur, Tournon, Sir William Gell, &c.)

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* The Roman legion in the time of Polybius consisted of 4200 infantry (or in time of peculiar emergency 5000 infantry) and 300 cavalry. The Consular army was formed of two legions; with a body of allied foot, equal in number to the infantry of the legions, besides the extraordinaries, chosen troops of the allies, who probably amounted to 2100, or when the legion was of 5000 infantry, to 2500, and of allied horse, thrice the number of the legionary cavalry; of these allied horse one-third were drafted for the extraordinaries, making the total of the Consular army 18,900, or 22,500 infantry and 2400 horse.

This province is now divided into two administrative jurisdictions, namely, the Delegation of Frosinone and Pontecorvo, and the Comarca of Rome. The towns of the Delegation of Frosinone are—Frosinone, the antient Frusino, a town of the Volsci, afterward a Roman colony; it is built on a hill at the opening of the valley of the Cossa into that of the Sacco, in the midst of a well-cultivated country, is the residence of the delegate, has an old castle, a college or gymnasium, and 7000 inhabitants; Ferentino, with 6700 inhabitants, a bishop's see, has remains of antient Pelasgic or Cyclopean walls as they are called, which are found in many places in this district, and have been examined and described by Petit-Radel, Dodwell, and Madame Dionigi; Alatri, built on a steep hill above the valley of the Cossa, is a bishop's see, has 8000 inhabitants, and manufactories of coarse woollen cloth. On the summit of the hill is a vast space, surrounded by a wall formed of large irregularly-shaped stones, many from six to nine feet in length, put together without any cement, but fitting admirably. The wall of this Acropolis is twelve feet thick, and in some places fifty feet high. Two gates lead into the enclosed space, where the cathedral and the episcopal palace have been built. Veroli, a bishop's see, also built on a mountain, has 7000 inhabitants, mostly agriculturists; N. of it, near the source of the Cossa, is the fine Carthusian convent and church of Trisulti, built in a wild glen of the Apennines; and near the village of Collepardo is a vast cave in the form of a dome, nearly 200 feet high, full of splendid stalactites. Anagni has 5400 inhabitants. (ANAGNI.) Ceccano has 4500 inhabitants, and Ceprano on the Liris, above its junction with the Sacco, and on the frontier of the kingdom of Naples, has 2500. The other towns are: Banco, 3800, with manufactories of woollens, and an extensive view into the valley of the Liris, and towards Venafro in the valley of the Volturno. Monte San Giovanni has 3500 inhabitants and manufactories of woollens and a brisk trade. Segni, the antient Signia, is built on the ridge of the Lepini, with Cyclopean walls of four miles extent and seven gates, and the remains of an antient temple now turned into a church; it is a bishop's see, and has 3500 inhabitants. Paliano, with 3000 inhabitants and a large baronial castle, was for a long time the residence of the powerful family of Colonna. All the above towns, besides several others with between 2000 and 3000 inhabitants, are situated at a short distance from each other, in or near the valley of the Sacco, along which runs the road from Rome to Naples, by San Germano, the antient Via Latina. Foreign travellers, however, prefer the lower or Appian road by the Pomptine marshes, which is better; but the country is unwholesome and desolate. On the S. slope of the Mounti Lepini, looking towards the Pomptine marshes, are Piperno, the antient Privernum, with 3600 inhabitants; Sezze (Setia), 5300 inhabitants; Cori (Cora), with its fine temple of Hercules, its Cyclopean walls, and 4300 inhabitants; Sermoneta, with 2000; Norma, the antient Norba, destroyed by Sulla, 1500 inhabitants. At the E. extremity of the Pomptine marshes, on the high road to Naples, is Terracina, the antient Anxur, with some handsome modern buildings, many antient remains, a bishop's see, and 4000 inhabitants, in the midst of a most luxuriant but unwholesome region.

Beyond the mountains E. of Terracina, which form the boundary of the Papal state, is the town and territory of Pontecorvo, in the valley of the Liris, and in the midst of the Neapolitan territories, but belonging by an old donation to the see of Rome. Pontecorvo has a population of 6500, a cathedral, and a long bridge over the Liris.

The Comarca or territory of Rome, which is under the jurisdiction of the governor of that city, has, besides the capital, the following towns:—Tivoli, with 5500 inhabitants. Subiaco, in the valley of the upper Anio, with a fine monastery of Benedictines, and the cave in which St. Benedict began his ascetic life; the town of Subiaco has 4800 inhabitants and some paper manufactories. Palestrina, on a hill, and with a wholesome climate; population, 4300. Frascati, one mile from the antient Tusculum, and now one of the favourite country-residences of the Roman nobles and wealthy citizens; population, 4300. Albano, another place of resort; population, 5000. Genzano, on a southern offset of the Alban hill, surrounded with vineyards, which produce a pleasant light wine; population, 4000. Velletri, the antient Velitræ, the birth-place of Augustus, a large town, built on the S.E. slope of the Alban mount, has some fine palaces and fountains, and 10,000 inhabitants; the country around is planted with vines. La Riccia (Aricia), with a fine palace of the Prince Ghigi, and a church by Bernini. Nettuno, on the sea coast, with the port of Anzo, Ardea, Civita Lavinia (the antient Lanuvium, built upon a S. projection of the Alban hill, and quite distinct from Lavinium, the modern Pratica, which is near the sea shore, between Ostia and Ardea), Laurentum (now Torre Paterno), Ostia, are all decayed villages, with historical names and recollections.

The name of Campágna di Roma was adopted in the middle ages, to distinguish the country from the neighbouring Campania, or Campágna Felice, in the kingdom of Naples. The depopulation of the Campágna of Rome is often, though most erroneously, attributed to Papal misgovernment; it is an historical fact that it was nearly as desolate in the time of Cicero as it is now. The depopulation of the country dates from the early conquest by Rome of the various people who inhabited Latium; the long obstinate resistance of the latter, and especially of the Volsci, in consequence of which most of their towns were destroyed; the subsequent devastations by Sulla; and the custom of the Roman patricians to abandon their vast estates to the cultivation of slaves and the care of overseers. The lowlands near Rome are mentioned as unwholesome by Livy, Cicero, Strabo, Horace, &c. After the fall of the Western empire, the devastation of Latium became complete, and Rome, reduced to a population of less than 20,000 inhabitants, stood literally in the midst of a desert. After the return of the Popes from Avignon, in 1377, the population both of Rome and its territory began gradually to increase again. Since the pontificate of Sixtus V., 'the restorer of public peace and security' (1585-90), it has been steadily though slowly increasing. The two French invasions (1798-1809) checked this progress, and the population rapidly declined, but it has increased again since the restoration of the Papal court and government in 1814. It is probably owing to the Papal government that Rome and the Campágna are not reduced to the condition of Babylon or Palmyra. No administration could render the lowlands of the Campágna healthy, or fix a population in them. Those provinces of the Papal state which enjoy a more salubrious atmosphere, such as Umbria, Perugia, the valley of Rieti in Sabina, the Marches, are among the finest, most populous, and best cultivated in all Italy. The whole of this question has been fully treated by Tournon, in his *Etudes Statistiques sur Rome*, in which he gives a minute description of the Campágna, and also in the *Foreign Quarterly Review*, No. xxi., Jan., 1833.

The cultivation of the plains of the Campagna is peculiar. Chateauvieux (*Lettres écrites d'Italie*) was the first foreigner who examined it attentively and gave an accurate description of it. The farms are very large: some of them, such as that of Campomorto, contain above 16,000 acres. Some hundreds of labourers are engaged every year from the highlands for the service of one farm, between the months of October and June, and double the number at harvest time, after which they return to their hills, or come to the hospitals of Rome with the malaria fever. Many come 60 or 80 miles distance. During the summer months only a small number of permanent servants remain on the farms. This system of farming on a large scale is rendered necessary by the malaria, and the consequent depopulation of the plains. In the highlands and valleys of the Apennines property is much more subdivided, the farms are of moderate size, and most of the villagers have gardens and orchards or vineyards. (Chateauvieux and Tournon.) The highest summits in the Campágna are—Monte Cacume, in the Lepini ridge, 3500 feet; Monte Cavo, in the Alban ridge, 3000; Maschio d'Ariano (Mons Algidus), an E. projection of the Alban, 2950; Monte Tusculo, 2000.

CAMPAGNOLS. [MURIDÆ.]

CAMPAN, a valley and town in France, in the recesses of the Pyrenees. The valley of Campan is at the source of the Adour, and comprehends in reality two valleys, one of them watered by the Adour, and the other by the Trasports, a tributary of the Adour. The delightful scenery of the valley of Campan forms one of the attractions of the neighbouring watering place, Bagnères-de-Bigorre, the most frequented of this part of France. The mineral riches of the valley constitute however its chief claim to notice. It has granite and slate, but we are not aware whether these are quarried. It is from its marble that Campan derives its reputation. This is of different colours, some of purple and white with veins of green, and some of deep red veined with green and white. The grain of this marble is very fine, and the mass of it is of immense extent; it contains no marine fossil remains. It was quarried by the government of France before the revolution, and profusely employed in the embellishment of the royal residences; the beauty and vividness of its colours rendering it extremely suitable for the purposes of internal decoration. After the revolution, the works were for many years suspended, but the working of them seems to have been resumed.

The valley of Campan is one of the most fertile in the department (Hautes Pyrénées, Upper Pyrenees) in which it is situated; and the flocks, orchards, and gardens, which its inhabitants generally possess, enable them to live in comfort. The little town of Campan is on the left bank of the Adour, a short distance above Bagnères. Some woollen stuffs are woven, and there is a considerable manufacture of paper. Population, in 1832, 3015 for the town; 4171 for the whole commune.

The Pic du Midi de Bigorre, which overlooks the valley, rises to the height of 9544 feet.

CAMPA'N, MADAME, was the daughter of M. Genet, an officer in the foreign department under Louis XV. She was born about 1750. At 15 years of age she was appointed reader to the princesses, daughters of Louis XV. In 1770 she married M. Campan, and was soon after appointed first lady of the bedchamber to Marie Antoinette, then dauphiness. She remained with Marie Antoinette during her husband's reign, and was with her in the first scenes of the Revolution, up to the storming of the Tuileries on the 10th of August, when she narrowly escaped with her life. Being forbidden to follow her mistress to her prison in the Temple, she retired into the country, and at last opened a boarding-school at St. Germain en Laye. The establishment prospered, and was patronized by Josephine Beauharnois, who sent her daughter Hortense to it. In 1806, when Napoleon founded the establishment at Ecouen for the daughters and sisters of the officers of the Legion of Honour, he appointed Madame Campan to superintend it. After the restoration, the school of Ecouen being suppressed, Madame Campan retired to Mantes, where she died in March, 1822, leaving behind her a character for [illegible] virtues and considerable information and accomplishments. She has written—'Mémoires sur la Vie privée de Marie Antoinette, Reine de France, suivis de Souvenirs et Anecdotes Historiques sur les Règnes de Louis XV. et Louis XVI.,' translated into English in 1823. She gives the most faithful and impartial account of Marie Antoinette. Her recollections of the old court of Louis XV. are also curious.

CAMPANELLA. [MEDUSA.]

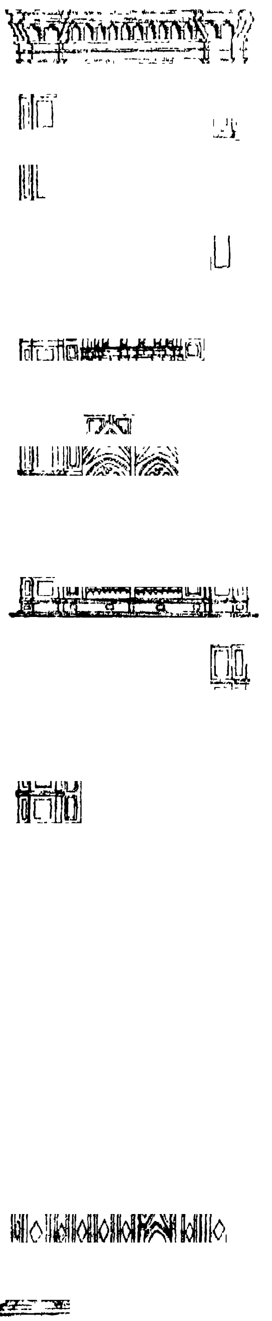
CAMPANI, MATTHEW and JOSEPH, two brothers, natives of the diocese of Spoleto, were alive in and after 1678. They are sometimes confounded, as by Weidler for instance. Matthew, the elder, was curate of a parish at Rome, and applied himself to watchmaking and optics. He is mentioned as having constructed a clock which was illuminated by night from the interior, and he published a work on the subject of clockmaking in 1678. But he is principally known as having been the first who ground object-glasses of enormous focal length. By order of Louis XIV. he made one of a focal length of 130, one of 150, and one of 205 palms (9¼ inches French, according to Auzout); and with one of these Dominic Cassini first saw the satellites of Saturn. His smaller glasses were much esteemed. Weidler says (of Joseph Campani, but we suspect it must be Matthew who is meant), on the authority of the *Journal des Savans*, 1665, p. 4, that he endeavoured to destroy chromatic aberration by means of a triple eye-glass. There is a paper of his in 'Gaudentii Roberti Misc. Ital. Phys. Math.,' Bologna, 1692.

Joseph Campani was also an astronomer, and made his own telescopes. He published various observations (see Lalande, *Bibl. Astron.*), and is the one referred to in AUZOUT.

CAMPA'NIA, the antient name of that part of the present kingdom of Naples which is now called Terra di Lavoro. The word Campania is probably derived from campus, 'a plain,' an etymology which Pliny (iii. 5) also assigns to the city of Capua, and which appears to us preferable to that given by Strabo, from caput, 'a head.' The Liris was the boundary between Campania and Latium. To the N. Campania was divided by the high Apennines from the country of the Marsi (the present Abruzzo), and to the N.E. by the Mounts Callicula, Tifata, and Taburnus from the country of the Samnites. A continuation of the same ridge between Abella, which was in Campania, and Abellinum, which was in Samnium, continued the boundary to the E. as far as the sources of the Sarnus. The off-set which there detaches itself from the same ridge, and runs in a W. direction, forming the peninsula of Surrentum, divided Campania from the country of the Picentini, the present province of Salerno. These were the limits of Campania under Augustus, when it formed one of the eleven regions of Italy. The limits of Campania were afterwards extended, and it was made to embrace the country of the Picentini, Beneventum, and also part of the E. Latium. Campania, as thus understood, is chiefly a plain enclosed between the sea and the mountains, which form a semicircular sweep from the mouth of the Liris to the promontory of Minerva. It was celebrated from the remotest times for its extraordinary fertility, and its soft and genial climate. The Osci, or Opici, and Ausones (probably all one people), are the first inhabitants of Campania recorded in history. Etruscan colonies afterwards spread to this country, and founded twelve cities, including Capua, which became the principal city of Campania. The Etruscans of Campania appear to have degenerated from their ancestors, and to have become licentious, insolent, and idle. The Etruscans were driven out or conquered by the Samnites, who finally yielded to the Romans. The cruel invention of the fights of gladiators, afterwards adopted by the Romans, and carried to a frightful extent, is attributed to the Campanians of Capua.

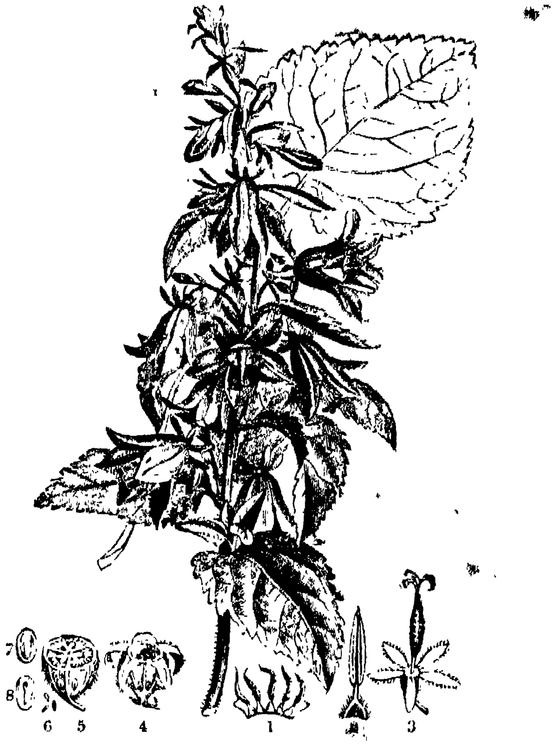
To prevent confusion as to the use of the term Campania, it should be observed that the district belonging to Capua was first called Campanus Ager, and this restricted and original meaning of the term should not be confounded with the subsequent enlarged meaning of the term Campania, as used by Strabo for instance, and other writers after his time. The Campanians of Capua, after being allies of Rome, took the part of Hannibal, and were severely treated by the Romans in consequence. [CAPUA.] Livy (xxiii, xxv.) speaks at length of the Campanians, their manners, and the part they took in the second Punic war. Liternum, Teanum, Calatia, Vulturnum, Baiæ, Atella, Acerræ, Abella, Nuceria, Nola, and the Greek colonies of Cume and Parthenope, or Neapolis (Naples), were all towns of Campania, in the enlarged meaning. The island of Capreæ (Capri) was reckoned a part of Campania. The Vulturnus was the principal river of Campania. (Strabo, p. 242, &c.) For a description of the country see TERRA DI LAVORO.

CAMPANI'LE, an Italian term signifying a tower for bells, or a church steeple. The word is derived from campana, 'a bell.' Many of the Italian churches have these towers or campanili separated from the body of the church. Among the most remarkable are those of Cremona, Florence, Ravenna, Padua, Bologna, and Pisa. Some of them are much out of the perpendicular, especially those of Pisa and Bologna. The Garisenda, built by the Garisendi, at Bologna, is 153 feet high, and 8 feet 6 inches out of the perpendicular. Dante has compared this tower to the inclined figure of Antæus. (Dante, *Inf.*, canto xxxi. l. 135.) The Asinelli tower, also at Bologna and close to the former, is 320 feet high, and 3 feet 6 inches out of the perpendicular. The leaning tower at Pisa is 150 feet high, and 13 feet out of the perpendicular. The campanile of Cremona is the highest in Italy, having an elevation of 395 feet. The campanile of Florence, which is 267 feet high, was constructed by Giotto in 1324, and is considered the most elegant campanile in Italy. The plan is a perfect square, 45 feet on each side. The interior is divided into six floors, each of which is vaulted. The tower is ascended by 406 steps. The façade of the tower is in the Gothic style, mixed with somewhat of the Italian taste in architecture, which soon after prevailed over the Gothic. It is said that Giotto intended to surmount this tower with a spire 85 feet in height. The cathedral at Seville has a fine campanile 350 feet high, which was built in 1568 by Guever the Moor. This tower is called La Giralda, from its brazen figure bearing that name. This figure, though it weighs a ton and a half, turns with the wind.



[Campanile of the Cathedral at Florence, designed and built by Giotto.]

CAMPANULA'CEÆ, a natural order of monopetalous dicotyledonous plants, the character of which is to have an inferior three or more celled fruit, containing many minute seeds, combined with a regular corolla, distinct stamens equal in number to the lobes of the corolla, dilated bases to the filaments, a downy style, and a milky juice. It consists of plants usually herbaceous, sometimes shrubby, scattered over all parts of the globe, but most abundant in the form of species related to the common campanula or bell-flower, in the milder parts of Europe and Asia. The flowers are commonly blue, purple, or white, occasionally rose-coloured, very rarely yellow, as in a Canary shrub called Musschia Aurea. None of the species are poisonous, notwithstanding that the order is very closely allied to the dangerous lobeliaceæ, which hardly differ except in having irregular flowers and syngenesious stamens. An excellent botanical account of this order was published by Alphonse De Candolle, under the name of *Monographie des Campanulées.* 4to., Paris, 1830.



[Campanula rapunculoides.]

1, the base of the corolla, with the stamens; 2, a stamen separate: 3, a lyx with the style and stigma; 4, a ripe seed vessel, 5, a section of the same; 6, seeds natural size; 7, a seed magnified; 8, a section of the same

CAMPANULA'RIA. [SERTULARIDÆ.]

CAMPA'NUS, JOHN, of Novara in the Milanese, the first translator of Euclid from the Arabic. Blancanus (*Chron. Math.*) places him between A.D. 1000 and 1100, but says that by his own account he wrote a calendar in the year 1200. Vossius confirms the latter, and cites the calendar in question, and also Blancanus in confirmation, without noticing the discrepancy. Riccioli contends for A.D. 1030. There is no doubt the writer of the calendar lived about A.D. 1200, but whether an earlier Campanus might not have been the translator of Euclid is a question. Tiraboschi (cited by Montucla) has shown that there was a Campanus who was chaplain to Pope Urban IV. (elected 1261), but we do not see on what grounds Tiraboschi positively affirms this one to have been the translator of Euclid.

This translation was the first printed, and we shall give an account of this early triumph of the art. There is no title-page; the first words being 'Preclarissimus liber elementorum Euclidis perspicacissimi: in artem Geometrie incipit quã foelicissime: punctus est cuius ps nõ est,' &c. At the end we find '¶ Opus elementorũ euclidis megarensis in geometriã artẽ In id quoq; Campani pspicacissimi Cõmentationes finiũt. Erhardus ratdolt Augustensis impressor solertissimus. venetiis impressit. Anno salutis. M.cccc.lxxxij. Octavis. Caleñ. Juñ. Lector. Vale.'

There is a preface by Ratdolt, in which he complains that among the *vast number of books* then printed at Venice, there should be so few on mathematics. This he attributes to the difficulty of representing diagrams, and states that he has discovered a method of printing them as easily as letter types. This appears to be wood-cutting; and the diagrams are on a broad margin by the side of the black letter.

The translation itself is evidently from the Arabic, not from the Greek. Several Arabic terms are introduced; an equilateral rhombus is called *helmuaym;* a parallelogram, *similis helmuaym* in the definitions, but afterwards a *parallelogram;* a trapezium is *helmuariphe.* There was a reprint of Venice in 1491, not by Ratdolt; and the commentary of Campanus was reprinted by Henry Stephens at Paris in 1516 in the edition of Zamberti. Billingsley's English translation, best known by John Dee's preface, was made from Campanus.

For a copious list of MSS. of Campanus in different libraries, &c., see Heilbronner, *Hist. Math. Univ.* (Index.)

CAMPBELL, GEORGE, author of several works of reputation, was born at Aberdeen in 1709. He relinquished the law for the purpose of studying divinity. In 1759, after having fulfilled pastoral duties since 1741, he was appointed Principal of Marischal College, Aberdeen. In 1763 he published his 'Dissertation on Miracles,' in reply to Hume's work on the same subject. It was translated into French and Dutch, and sold extensively. The degree of D.D. was soon afterwards conferred upon him by King's College, Aberdeen. In 1771 Dr. Campbell was appointed Professor of Divinity. In 1776 he published his most valuable work, the 'Philosophy of Rhetoric.' [BLAIR.] His last work was a 'Translation of the Gospels, with Preliminary Dissertations and Notes,' in 2 vols. 4to. He died in 1796, having resigned his professorship some years previously, on which occasion the king granted him a pension of 300*l.* a year.

CAMPBELL, JOHN, a writer on biography, history, politics, and statistics, was born at Edinburgh, March 8, 1708. At the age of five years he left Scotland, and never after visited it. He was placed in an attorney's office, but relinquished the law for a literary career. Before his thirtieth year he published (in 1736) 'The Military History of Prince Eugene and the Duke of Marlborough,' in 2 vols. folio He was next engaged as one of the writers in the 'Universal History.' In 1739 he published the 'Travels and Adventures of Edward Brown, Esq.,' 8vo.: in the same year 'Memoirs of the Bashaw Duke de Ripperda,' 8vo.; in 1741 a 'Concise History of Spanish America,' 8vo.: in 1742 'A Letter on the Discovery, Importance, and Utility of the Thurlow State Papers;' in the same year the 1st and 2nd vols. of the 'Lives of the English Admirals and other eminent British Seamen,' which work was completed by the appearance of two other volumes in 1744. This work, he says in a letter to one of his friends, cost him a great deal of trouble, and he endeavoured to be strictly impartial. Three editions were published in his lifetime. In 1744 he published in 2 vols. folio a collection of 'Voyages and Travels' on an improved plan. In 1745 he commenced his labours in the 'Biographia Britannica.' Dr. Kippis, his coadjutor in this work, passed a high encomium upon the part taken by Mr Campbell, and attributed much of its success to him. He wrote the 'Introduction to Chronology,' and the 'Discourse on Trade in Dodsley's 'Preceptor.' In 1750 he published a work 'On the Present State of Europe,' which met with great success. His most important work was published in 1774, in 2 vols. royal 4to., and is entitled 'A political Survey of Britain, being a series of Reflections on the Situation, Lands, Inhabitants, Revenues, Colonies, and Commerce of this Island, intended to show that we have not as yet approached near the summit of improvement, but that it will afford employment to many generations before they push to the utmost extent the natural advantages of Great Britain.' Dr Kippis enumerates sixteen or seventeen other works of a less important character by Dr. Campbell. In 1754 the degree of LL.D. was conferred upon him by the Glasgow University; and in 1774 the empress of Russia presented him with her picture. Dr. Campbell married in 1736, and died Dec. 28, 1775. He was interred in the burial ground of St. George the Martyr, near the Foundling Hospital, London, where a monument was erected to his memory. Only one child, out of seven which he had, outlived him. In 1765 he was appointed by the government his majesty's agent for the province of Canada, which office he retained until his death.

CAMPBELLS, LORDS OF ARGYLL. They trace their lineage to an individual of their name who in the 12th century married the daughter of a Gaelic chieftain and got with her the lordship of Lochow in the shire of Argyle. A few descents bring us down to Gillespie Campbell, laird of Lochow, who witnessed a charter of King Alexander III in the year 1266, and whose son and heir, COLIN CAMPBELL of Lochow, surnamed the Great from his stature, received the honour of knighthood from the same king. This Sir Colin was, in 1291, one of the nominees of Bruce, when the title of the latter to the crown was to be investigated before King Edward I. He was soon afterwards killed in a conflict with the lord of Lorn; and as his sons also assisted Bruce in crushing that powerful lord, they shared largely in his forfeited estates,—on his ruins indeed the family rose to the chieftainry of Argyle. Sir NIEL CAMPBELL of Lochow, son of the said Sir Colin, was further rewarded with the hand of the Princess Mary, sister of Bruce, by whom he had SIR COLIN CAMPBELL of Lochow, who retook for King David Bruce the castle of Dunoon, and was, in consequence, appointed heritable keeper thereof. His great-grandson, SIR DUNCAN CAMPBELL of Lochow, who was one of the hostages for the ransom of King James I., was by that prince constituted one of the privy council and afterwards justiciar and lord-lieutenant of the shire of Argyle. In these offices he was continued by King James II., who also made him a lord of parliament by the title of Lord Campbell, and on his death advanced his grandson COLIN, second Lord Campbell, to the dignity of Earl of the county of Argyll.

In 1463 his lordship was joined in a commission to negotiate a truce with England: and soon after his return he was made master of the household, and in 1465 associated with Lord Boyd in the high office of lord justiciar south of Forth, which he exercised alone from 1469 to 1475, when he was sent as a plenipotentiary into England. He was some time afterwards sent ambassador to France to renew the league with that crown; and on the death of Bishop Livingstone was, in 1483, made lord high chancellor of the kingdom, in which post he remained till the spring of 1488 when he was sent into England on a public embassy.

On the accession of King James IV., in June that year he was reinstated in the chancellorship, and so continued till his death in the beginning of 1493. His son ALEXANDER, second Earl of Argyll, commanded the vanguard of the Scots army at the battle of Flodden, and fell there with the king and many others. His son COLIN, third Earl of Argyll, was soon afterwards appointed one of the four counsellors to King James V., from whom he also got a grant of the lordship of Abernethy, then in the crown by forfeiture, and thereafter a confirmation of the hereditary sheriffship of the shire of Argyle. He was also appointed to the high office of lord justiciar of Scotland, an office which remained thenceforward for a century hereditary in his family. He died in 1542, and was succeeded by his eldest son ARCHIBALD, fourth Earl of Argyll, who is memorable as the first person of consequence in Scotland who embraced the Protestant religion. He was twice married; and his sons ARCHIBALD, fifth Earl of Argyll, and COLIN, sixth Earl of Argyll, by separate marriages, were severally lord high chancellors of Scotland, but neither of them was otherwise remarkable: the latter indeed is described in a contemporary pamphlet as 'religious and of good nature, but weak in judgment, and very much held by his wife.' His son ARCHIBALD, seventh Earl of Argyll, was a military officer of considerable reputation; and, marrying twice, was the father of two very distinguished sons. The younger of these was, in 1622, created Lord Kintyre; but having no issue, the title expired at his death. The elder, ARCHIBALD, eighth Earl of Argyll, was born in the year 1598, and from his earliest years was noted for his piety and devotion. In 1628, when his father was abroad, having left the kingdom, the Lord Lorn resigned into the king's hands his hereditary office of lord justiciar, or, as it came to be styled, justice-general of Scotland.

In 1633, the Earl of Argyll having declared himself a convert to the Roman Catholic faith, was obliged to make over his estates to his son, reserving only a suitable maintenance to himself; and the following year Lord Lorn was appointed by the king one of the extraordinary lords of session. In the month of April, 1638, when the national covenant was framed and sworn to by nearly the entire population of Scotland, he was called up with others to London to give advice to the king under the existing circumstances of the kingdom; and though they were all equally aware that the covenant was obnoxious to the king, yet Argyll alone spoke freely and honestly, and recommended the utter abolition of those innovations which his had made on the constitution of the Scottish church. He returned to Scotland on the 20th May; and on his father's death, the same year, succeeded to all his honours and possessions. He attended the meeting of the general assembly at Glasgow that year, and there openly joined the church against the court. It was at this assembly that the oppressive policy of two reigns was subverted, episcopacy abolished, and presbyterianism established. To repress the rising of the M'Donalds and the Earl of Antrim, in aid of the invasion of Scotland by the royalists, which afterwards followed, Argyll proceeded to his own country, where he raised a force of 900 of his vassals, part of which he stationed in Kintyre, part in Lorn, and with the remainder he passed over to Arran, which he secured by seizing upon the estate of Brodick: this rendered the attempt on the part of the Irish at that time nearly impossible. On the resumption of hostilities, after the short pacification of Berks, he traversed, with a force of about 5000 men and a small train of artillery, the districts of Badenoch, Athol, and Mar, levying the taxes imposed by the estates of Scotland and enforcing submission to their authority.

When the king came to Scotland in 1641, with a view to a settlement of the kingdom, Argyle was qualified by his learning and talents, no less than by his services, for the post of lord chancellor, then vacant, but the king was afraid to aggrandise one already so powerful, and the place was bestowed on Lord Loudoun. Argyll, however, was created a marquis, by the title of Marquis of Argyll. In the disturbances and civil war which soon afterwards followed, Argyll took, as before, an active part; but circumstances occurred of a personal nature which made him throw up the commission which he held from the Estates as general of the army; and in February, 1646, he was sent over to Ireland to bring home the Scots troops which had been directed thither to assist in repressing the turbulence of the Catholics. He returned in May following; and in the of July in the same year, when the king had sur- himself to the Scottish army, Argyll went to castle to pay his respects to him, and he was afterwards employed in the conference with the parliament of England on the articles presented by the Estates to the king. He took also a leading part in the installation of Charles II., on whose head he placed the crown at Scone on January 1, 1651. He submitted, however, to the subsequent usurpation of Cromwell, and under Richard sat in parliament for the county of Aberdeen. For these compliances he was at the Restoration indicted for high treason, and being convicted he was beheaded on Monday, May 27, 1661. His attainder was justly imputed to the enmity, and his precipitate execution to the impatience, of Middleton, who anxiously wished a gift of his titles and estate; and it is nearly certain that the noble family of Huntley was saved from utter ruin only by these events: that family stood indebted to Argyll in a very large sum, and from 1653 to 1661 Lord [illegible] actually his residence in Gordon castle.

* The lord we have now mentioned was ARCHIBALD, ninth Earl of Argyll, eldest son of the marquis, having been restored to the estate and title of Earl of Argyll in 1663. He shared also largely in the profits and preferments which followed on the king's restoration; but having taken the Test of 1681 with this explanation, that he took it as far as it was consistent with itself and with the Protestant faith, he was accused by a bold and flagitious cabal of treason and leasing making, tried, and condemned. He made his escape from confinement, however, in the train of his step-daughter, Lady Sophia Lindsay, disguised as her page, and escaped to Holland. He afterwards returned, and, at the head of a considerable force, made a descent into Argyleshire; but being made prisoner, he was executed, on a single day's notice, on his former sentence. His own son, who had some time an allowance granted him out of his father's forfeited estates, offered to serve in the royal army against his father when he invaded Scotland previous to his execution. This son was ARCHIBALD, tenth Earl of Argyll, so acknowledged by parliament before the reversal of his father's attainder. He also sat in the Convention of 1689 as such; and was one of the commissioners deputed by the Estates to offer the crown of Scotland to the Prince of Orange, and to tender the coronation oath. The next year he was made a lord of the treasury, and in 1694 an extraordinary lord of session. In 1696 he was appointed colonel of the Scots Horse Guards, and afterwards raised a regiment of his own clan, which greatly distinguished itself in Flanders. On the 23rd June, 1701, he was created Duke of Argyll; and dying in September, 1703, was succeeded by his eldest son JOHN, second Duke of Argyll, who was thereupon sworn of the king's privy council, appointed captain of the Scots Horse Guards, and, though scarce twenty-five years old, raised to the seat occupied by his father as an extraordinary lord of session. This last place, however, he not long afterwards resigned in favour of his brother, Archibald Campbell, then lord high treasurer of Scotland, who, in the end of 1706, was created Viscount and Earl of Ilay, for his services in furthering the Union with England. For the like services Argyll had, in 1705, been created an English peer, by the titles of Baron Chatham and Earl of Greenwich. His grace after this served four campaigns under the Duke of Marlborough in Flanders, where he rose to the rank of lieutenant-general, and honourably distinguished himself in the battles of Ramillies, Oudenard, and Malplaquet, and at the sieges of Ostend, Meenen, Lisle, Ghent, and Tournay. On the change of ministry in 1710 he joined the court, and was appointed generalissimo in Spain; and on the same occasion his brother, the Earl of Ilay, was made lord justice-general of Scotland for life. On his Grace's return from the continent he changed his political party again, and was in consequence deprived of his government offices. When the Hanover family attained the throne, he was appointed commander-in-chief of all the king's forces in Scotland; and in repressing the rebellion of 1715 behaved with great energy and decision. On the 13th April, 1719, he was advanced to the dignity of Duke of Greenwich. After several changes in the political world he retired from public life, and died on September 3, 1743, when, leaving no male issue, his English titles of Duke and Earl of Greenwich and Baron Chatham became extinct. His other titles passed to his brother already noticed, ARCHIBALD, Earl of Ilay, and third Duke of Argyll. By these two brothers, as has been well remarked, the views of a certain party in Scotland at the Union to perpetuate their authority over their countrymen were actually realized, the whole kingdom having become subject to them through the servility of the few members which Scotland long returned to parliament. The latter, indeed, had the affairs of Scotland so entirely at his disposal, that he obtained the appellation of King of Scotland. He died on the 15th April, 1761, and, leaving no issue, his own immediate honours became extinct, while those of his family descended to his cousin,

CAMPBELLTOWN, a burgh and port in Argyleshire, near the southern extremity of the long narrow peninsula which, under the name of Cantire or Kintyre, projects into the Irish channel. It stands on a loch or indentation of the coast, which forms an excellent harbour, about two miles long and one broad, with from six to thirteen fathoms water. Campbelltown is 65 miles due W. by S. from Glasgow. It was formerly a burgh of barony, and was created a royal burgh in 1700. The town lies principally on the south-western side of the harbour; but it is extending round the head of the loch towards the north-eastern side. There are good quays, to which, if extended a few yards farther, ships of any burden might come with safety at all times of the tide on both sides of the harbour. The intercourse between Campbelltown and the mainland, particularly with Glasgow and Ireland, has been much increased by steam navigation.

The principal part of Campbelltown is built on the property of the duke of Argyle. The parliamentary boundary of the burgh is extensive, and comprehends a large quantity of land not built on, on both sides of the loch. In conjunction with Ayr, Irvine, Inverary, and Oban, Campbelltown returns one member to parliament.

The chief trade is in whiskey. In 1832 there were fifteen distilleries, which produced upwards of 60,000*l*. per annum to the excise. There are coal mines about four miles from the town, and a canal, by which the coal is conveyed. In addition to the trade in whiskey, considerable quantities of potatoes are exported, chiefly to Ireland. The principal imports are barley from Ireland, and coals from Glasgow and Ayrshire. The population of the burgh in 1831 was 4,869. (*Boundary Reports.*)

CAMPEACHY, a town in the state of Yucatan, which is one of the members of the Mexican Union. It is situated on the W. coast of the peninsula of Yucatan, on that portion of the gulf of Mexico which is sometimes called the

Bay of Campeachy, but more appropriately the Bay of Vera Cruz. The former name properly belongs to that smaller and open bay on which the town is built. Campeachy is in 20° N. lat., an[illegible] 30′ W. long. Vessels cannot enter the mouth of the Rio S. Francisco, on which the town is built, but must remain in the bay at a considerable distance from the shore. The town contains about 18,000 inhabitants, and is defended by a fort. Its exportations consist of Campeachy-wood and wax. The wood is cut in [illegible]l places, especially on the banks of the Rio Cham-[illegible] S. of the town; and the wax is got from the wild bees without stings, which are common in the country to the east.

CAMPER, PETER, was born at Leyden on the 11th of May, 1722. His father, Florent Camper, was a clergyman, who numbered among his friends Boerhaave, 'sGravesande, Musschenbroeck, and Moor; and it was in the society of those celebrated men that Camper spent much of his youth, and imbibed that love of science and the fine arts for which he was afterwards distinguished. He was instructed in drawing by Moor, and in geometry by Labordes. On entering the university of Leyden he devoted himself with unwearied assiduity to the study of medicine, under Gaubius, Van Rooyen, the elder Albinus, and Trioen. Under these masters he soon rose to distinction; and when he took his degree of doctor in philosophy and medicine in 1746, he published two dissertations,—the one 'De Visu,' the other 'De Oculi quibusdam partibus,' which have been much praised by Baldinger. In 1748 he visited London, where he associated with Mead, Pringle, and Pitcairn, and where his taste for natural history was awakened by the cabinets of Sir Hans Sloane and Collinson, and the collections of Hill and Catesby. He spent nearly 12 months in England. On his return he successively occupied the chairs of philosophy, anatomy, surgery, and medicine in the universities of Franeker, Amsterdam, and Groningen. When entering upon these professorships he delivered introductory lectures, which were remarkable for the comprehensive knowledge which they evinced in physics, medicine, and anatomy, as well as for an uncommon talent of observation. He obtained a prize from the Academy of Sciences in 1772, and an *accessit* in 1776; a prize from the Academy of Dijon in 1779; from that of Lyons in 1773, and that of Toulouse in 1774; and from the societies of Haarlem and Edinburgh, and the academy of surgery. He was a member of the Academies of Berlin and Petersburgh, and of the Royal Societies of London and of Göttingen; and in 1785 was made a foreign associate of the Academy of Sciences at Paris, being the only Dutchman, except Boerhaave, who had attained that honour. He was also a member of the state-council of the United Provinces, and a deputy in the assembly of the States of the Province of Friesland. He died of a violent pleurisy on the 7th of April, 1789, in the 67th year of his age, leaving behind him the well-earned reputation not only of a distinguished anatomist and philosopher, but of an honest man. His works, or rather detached essays, are exceedingly numerous. Besides his 'Demonstrationes Anatomico-pathologicæ,' of which two parts only appeared, the one containing the structure and diseases of the human arm, the other the structure and diseases of the human pelvis, he published separate dissertations upon the following subjects:—on 'the cause of hernia in new-born children;' on 'the sense of hearing in fishes;' on 'the physical education of children;' on 'inoculation for the small-pox;' on 'the origin and colour of negroes;' on 'the signs of life and death in new-born children;' on 'infanticide, with a project for the establishment of a foundling hospital;' on 'the causes of infanticide and suicide;' on 'the intromission of air into the lungs of new-born children;' on 'the operation of lithotomy at two different times according to the celebrated Franco' (that is, on the first day the surgeon makes the incision into the bladder, the patient is then to be put to bed, and the extraction of the stone is deferred to the second, third, or fourth day); on 'ulcers in the urethra,' &c.; on 'the orang-outang and other kinds of apes;' on 'cancers,' &c.; on 'lameness in infants;' on 'lithotomy;' on 'the classification of fishes according to the system of Linnæus;' and on 'the fracture of the patella and olecranon.' He also presented the following memoirs to different societies: on 'the callus of fractured bones;' on 'the advantages and best [illegible]s of inoculating for the small-pox;' on 'the theory [illegible] treatment of chronic diseases of the lungs,' &c.; on 'the construction of trusses, and the best method of [illegible]pering steel for these instruments;' on 'the structur[illegible] the great bones of birds, and the manner in which atmospheric air is introduced into them;' on 'the cure of ulcers;' on 'the characteristic marks of countena[illegible]ons of different countries and ages,' which [illegible] published by his son in 4to. in 1791, [illegible] by the description of a method of delineating [illegible]rts of heads with accuracy; on 'the discovery of the glands in the interior of the sternum;' on 'contagious diseases among cattle;' on 'specific remedies;' on 'the effects of air, sleep, &c. in the cure of surgical disorders;' on 'the nature, treatment, &c. of dropsy;' on 'physical beauty;' on the question, 'Why is man exposed to more diseases than other animals?' and on 'the fossil [illegible] of unknown and rare animals.' In 1792 his son [illegible]lished a sequel to the work on the [illegible] [illegible]nc[illegible] features, &c. entitled 'Lectures of [illegible] Pet[illegible] C[illegible] on the manner of delineating the different emotions [illegible] in the countenance,' &c.; and in 1803 a collection [illegible] works appeared at Paris in 3 vols, 8vo. with a folio [illegible] plates under the title of 'Œuvres de Pierre Cam[illegible] ont pour objet l'Histoire Naturelle, la Physiologie, et l'[illegible]tomie Comparée.' His 'Icones Herniarum' was published at Frankfort by Soemmering, 1801, folio. Among [illegible] prominent points in his works, we may mention hi[illegible] of the presence of air in the bones of birds; his demonstra[illegible]tion that the curvature of the urethra is greater in [illegible] than in adults; his remarks on the variation of the [illegible] angle in different nations; his account of Roenhuysen's lever, used in the practice of midwifery; his dissertation on the best form for shoes; and his osteological investigations into lost races of animals.

CAMPHOR is the stearopten, or one of the p[illegible] arising from the separation of the volatile oil of two [illegible]; the one, *Cinnamomum Camphora* (Nees v. Esenbeck), [illegible]tive of Japan, China, and Cochin China; the other, *Dip[illegible]carpus Camphora*, or *Dryobalanops Camphora* (Coleb[illegible]), a native of Borneo and Sumatra. From these it is pro[illegible] by different processes. It exists in every part, root, s[illegible], branches, and leaves, of the first-mentioned tree, which is chopped into pieces sufficiently small to be thrown into [illegible] vessels: these vessels are afterwards covered with earthen hoods, in which are placed rice-straw and rushes, heat being subsequently gradually applied. The camphor is volatilized, and afterwards condenses on the straws, rushes, &c. This, after being purified from the intermixture of straws, is found in commerce under the name of crude camphor. But it still retains many impurities, and on ar[illegible] in Europe is refined, formerly exclusively at Venice, now [illegible] in England and Germany.

From the Dipterocarpus Camphora it is not procured by distillation, but exists in a solid form in the stem of the tree. In that part of the stem which should be occupied by the pith it is found along with camphor-oil. When tapped or opened while young nothing but oil [illegible] time a great quantity of this oil assumes the so[illegible] form, and is found at intervals along the trunk in pieces a foot or a foot and a half long. The process of extracting the oil is effected by means of a Malay axe used to lay open the trunk at about [illegible] inches from the ground, till near the heart, when a small incision is cautiously made, and the oil if present gushes out, and is received into bamboos and other vessels. If camphor is suspected to be present the tree is felled, cut into pieces about a fathom long, which are then split, and the camphor is found in pieces of the length stated, and about the circumference of the human arm. A tree of moderate size may yield about 11 pounds, while a very large one may produce twice that quantity. The camph[illegible]ained is called Se Tantong or head camphor; but the [illegible] which surrounds the camphor on being scraped yields an inferior sort, called belly and foot camphor. The camphor from this tree is much less volatile and transparent [illegible] from the former.

The oil is much prized and used in the East, but is not sent to Europe. So much more is the Borneo and Sumatra camphor esteemed than the other, that, even in the markets of Japan, 200 pounds of the camphor of the latter country will be given in exchange for [illegible] of the former. The Bornean camphor is white li[illegible], but has the same smell and taste as that of Japan.

The [illegible] of refining consists in exposing the camphor in large [illegible] in flat glass baskets, along with a little char coal, caustic lime of chalk, during which the Sumatra camphor diffuses an odour like violets. Refined camphor is in round cakes, convex externally, concave internally, generally with a hole in the centre, each weighing about two pounds; the cakes are wrapped in strong blue paper, and exported in vessels weighing about 500 pounds, containing 250 or [illegible]

Camphor is an organic substance of a peculiar kind, representing the volatile oils in a solid state. It differs from them, however, not only in being solid at the ordinary temperature of the air, but in not being converted by the oxygen of the air into a resin. It is so volatile that on exposure to the air it is entirely volatilized, and leaves no residuum. It has an unctuous feel, possesses considerable tenacity, and is not easily powdered, without the addition of alcohol, æther, or [illegible] the Sumatra camphor however can be powdered without such aid. It is nearly insoluble in water (requiring 530 parts for its solution), but very soluble in alcohol, the ethers, eupion, creosote, the empyreumatic, volatile and fixed oils. It is precipitated from most of its solutions, in an unchanged state, on the addition of water. Its specific gravity is 0.985; its ultimate composition is, according to Blanchet and Sell,

Carbon . . .	79.28
Hydrogen . .	10.34
Oxygen . . .	10.37

[illegible]28° of Fahrenheit's thermometer it melts, at 400° it boils; it is easily ignited, burning with a bright flame and much smoke, but leaving no residuum. Its odour is strong and peculiar, its taste aromatic but bitterish, leaving behind it a feeling of coldness in the mouth.

Camphor acts upon the animal frame, both in the state of vapour and in the solid state. Few insects can endure the pungent odour of camphor; and in combination with strong acetic acid it acts as a powerful stimulant in cases of a disposition to fainting. When six or eight grains are received into a stomach in which there exists no increased sensibility, the person also not being in a state of excitement, the first effect is a feeling of burning and warmth, which gradually extends from the epigastrium over the whole body, occasionally accompanied with unpleasant feelings in the stomach, such as slight pain, eructations, &c. The pulse soon rises, becomes fuller and undulating; the heat of the skin is gently increased, and a warm and gentle but regular perspiration follows. All muscular actions take place with more ease: the nervous system in its whole range is roused and strengthened, and a feeling of general comfort pervades the whole frame. In from one to three hours this state abates, without leaving sleepiness, lassitude, or any unpleasantness behind.

A larger dose, half a drachm or two scruples, causes a burning heat in the palate and stomach, with pain, disposition to vomit, and great disturbance of the nervous system (the severity of which is determined by the amount of action on the stomach), giddiness, sense of constriction in the head, ringing of the ears, flickering of objects before the eyes, errors of vision, tremblings of the limbs, and impossibility of maintaining the erect posture, or of walking. During the continuation of this state, shiverings, with paleness of the skin and countenance, diminished warmth of skin, a slow, feeble, and contracted pulse, a laborious respiration, and threatenings of faintings or convulsions exist. When death results, the stomach is discovered to have been the seat of violent inflammation. Camphor may therefore be regarded as a powerful stimulant, at first local, but afterwards extending to the brain, spinal chord, and ganglionic

It is [illegible] in the low or sinking stage of almost all fevers, particularly where the nervous system is much depressed. At an earlier stage of the same disease, along with antimonials or opium, it often has a very beneficial effect on the skin, promoting regular and warm perspiration. It has also been used along with nitrate of potassa during the interval of an intermittent fever, to prevent a return of the paroxysm. In exanthematous fevers, such as small-pox, measles, scarlet fever, &c., it is often very serviceable during the eruptive stage, when the eruption does not come out freely, from want of sufficient nervous energy. In such circumstances, [illegible] with serpentaria, it is superior to any other means.

In chronic nervous diseases, such as [illegible] ncy to convulsions of certain kinds, epilepsy, St. [illegible] similar disorders, it is often a valuable agent or vehicle for other remedies. Its external application as a rubefacient, in cases of cramps and neuralgic pains, is often of great service.

In many cases of irritability of the urinary organs it is useful.

It is administered either in powder, in which case it must be minutely divided and mixed with other substances, or in aqueous solution (a very feeble preparation, though it possesses the odour), or alcoholic solution. When it is dissolved in oil, it forms a useful application to joints and other parts suffering from chronic rheumatic pains.

The use of camphor in the form of vapour from a bag carried round the neck, as a prophylactic during the prevalence of epidemic fevers, is hurtful. It produces depression of the nervous power, muscular debility, difficulty of respiration, and favours the very action of the morbific agent which it was intended to prevent. Its employment even in museums to protect the objects from insects, and among clothes to ward off moths, is injurious, if much be volatilized and diffused through the apartments.

Camphor exists in several plants and trees besides those above mentioned; and a substance resembling camphor, and generally considered to be such, can be procured from many plants. It is in most cases, however, a hydrate of volatile oil, such as the Coumarin or odorous principle of the Tonka bean, Helenin from the Inula Helenium. An artificial camphor may be prepared by the mutual action of hydro-chloric acid gas and oil of turpentine: it is white, possesses a camphor-like odour, is soluble in alcohol, &c.

CAMPHOR-TREE. [Lauraceæ, and Dipterocarpus.]

CAMPHOR-OIL. a substance obtained in Borneo and Sumatra, from the dryobalanops camphora. It is supposed to be camphor in an imperfect state of formation.

CAMPHORIC ACID. This acid is obtained by heating camphor in a retort, with seven times its weight of nitric acid of sp. gr. 1·25; the acid which distils into the receiver is to be returned to the retort, until nitric oxide ceases to be evolved. In this operation no carbonic acid is formed. During the cooling of the contents of the retort, camphoric acid crystallizes, which is to be purified by repeated solution in boiling water and by crystallization. This acid is sometimes in small scales, and at others in needle-formed crystals. It is colourless; its taste is at first weak, but is afterwards acid, and finally bitter. At usual temperatures it is inodorous, but when gently heated, it exhales a smell of camphor, which eventually becomes penetrating and acrid. At about 100° Fahrenheit it vaporizes, and at 145° it fuses into a colourless fluid, which crystallizes on cooling. At a higher temperature, a portion of the acid sublimes unchanged; the mass becomes gradually deeper coloured, swells, yields empyreumatic oil and a small quantity of empyreumatic water, and charcoal is left; the products of distillation contain, however, camphoric acid to the last.

One hundred parts of water at 202° dissolve 12 parts of camphoric acid, and at 56°, 1·13 parts. It is much more soluble in alcohol, 100 parts taking up 121 at 144°, of which about 110 remain in solution on cooling. It is also soluble in æther; and hot oil of turpentine also dissolves it, but the greater part crystallizes on cooling.

According to Liebig, camphoric acid is composed of

Five equivalents of	oxygen	=	50·0000	36·82
Fifteen „	hydrogen	=	9·3597	6·89
Ten „	carbon	=	76·4370	56·29

Camphoric acid unites with salifiable bases to form salts called *camphorates*. Not one of them is applied to any purpose whatever. Those which are soluble have almost all of them an aromatic bitter taste; the aqueous solutions are decomposed by the stronger acids, and they all burn and are decomposed by heat.

CA'MPO FO'RMIO, a village four miles S.W. of Udine, in the Venetian province of Friuli, on the high road to Treviso and Venice. It is celebrated for the treaty of peace concluded here, 17th October, 1797, between General Bonaparte, in the name of the French republic, and Count Cobentzel and General Meerfold, the Austrian plenipotentiaries. By that treaty the emperor of Austria resigned Lombardy and Flanders, and received the Venetian States as a compensation. During the negotiations Bonaparte's head-quarters were at Passeriano, a few miles from Campo Formio, near the banks of the Tagliamento. [BONAPARTE.]

CAMPOMA'NES, COUNT PEDRO RODRIGUEZ, a distinguished Spanish civilian and statesman of the 18th century. In 1765 he was appointed fiscal advocate to the royal council of Castile, and was made afterwards minister of state. He was a friend of Aranda, and took part in the expulsion of the Jesuits by that minister. [ARANDA.] He laboured zealously to rouse the industry of Spain from its state of torpor, and wrote several good works on the education of the people, and especially of the artizans. Under the ministry of Florida Blanca, Campomanes was removed from the council, and lived afterwards in retirement until his death which took place towards the beginning of the present century. He was director of the Spanish academy of history, one of the few useful learned institutions of Spain, and was also a member of the Academy of Belles Lettres of Paris, and of the Philosophical Society of Philadelphia. His principal works are: 'Antiguidad Maritima de la Republica de Cartago,' with a translation of the 'Periplus of Hanno,' illustrated by copious notes, 4to. Madrid, 1756. 'Discurso sobre el Fomento de la Industria Popular, 8vo. Madrid, 1774. 'Discurso sobre la Educacion Popular de los Artesanos, y su Fomento,' 8vo. Madrid, 1775. In this last treatise he combated the idea, then general in Spain and most other countries of the continent, that mechanical professions were in their nature low and abject. He contended that they were considered as such because they were kept in a state of depression and degradation through the ignorance and indolence of those who exercised them in a slovenly manner. 'Let the mechanical arts be improved and ennobled by the assistance of education and scientific knowledge; let the artizans raise themselves by their skill, industry, and conduct, and the prejudice against the mechanical professions will give way.' These propositions of Campomanes appear now self-evident, but in his time, and especially in Spain, they sounded like a paradox, and it required a considerable degree of moral courage to assert them. As a continuation of the same subject, Campomanes wrote, 'Apendice a la Educacion Popular,' 4 vols. 8vo. Madrid, 1776—7. The first volume treats of the origin and decay of industry in Spain during the 17th century, with numerous quotations from writers of that age, and contains much interesting statistical and historical information on the internal state of Spain in that obscure period. The second volume treats of the means of encouraging and improving manufactures, and quotes the various royal decrees, ordinances, and privileges, issued at different times for that object, though apparently to little purpose. The third volume treats of the laws concerning the artizans, and especially of the municipal and corporate regulations, with extracts from foreign authors, especially French, on the manner of conducting various branches of manufactures. The fourth volume contains eight 'discursos' or dissertations on the public economy of Spain, by Francisco Martinez de Mata, a friar from Granada who lived about the middle of the 17th century, and whose writings had fallen into oblivion, and are not even mentioned by Nicolao Antonio in his 'Bibliotheca Nova.' They are interesting, considering the time in which they were written. Campomanes adds his own notes to them. Campomanes wrote also an historical dissertation on the order of the Templars, and a treatise on the mortmain property possessed by convents and other ecclesiastical bodies, in which he expressed opinions which drew upon him the hostility of several powerful dignitaries of the church, and probably contributed to his removal from office.

CAMPONTIA, a genus of marine annelides, separated by Dr. Johnston, and described by him in the 3rd vol. of the 'Zoological Journal,' p. 325. In the 8th vol. of the 'Magazine of Natural History,' p. 179, where a figure and enlarged description of the animal are given, Dr. Johnston says, 'When I first described this animal, its close resemblance to some caterpillars was particularly mentioned, but the suspicion of its being actually a larva did not occur to me; for I believed it to be an established fact among entomologists that no insect passed its preparatory stages in sea-water. I have been informed, however, that Mr. Mac Leay, and no higher authority can be given, has proved that the worm in question is the larva probably of some dipterous fly; and if this opinion is correct (which its anatomy strongly confirms), then it will follow that at least one larva naturally lives and undergoes its changes in the sea; a conclusion which, I think, is one of some importance and at variance with our present notions. Our campontia eruciformis may be found at all seasons, at the roots of sea-weed and corallines, in pools left by the recess of the tide. The very specimens before me were procured by myself, a few days ago, in parts to which no fresh-water could have access, and which are covered to the depth of several feet every tide, for they are near low-water mark.'

CA'MPSIA (*Lepeletier* and *Serville*), a genus of coleopterous insects, of the section Heteromera, sub-section Stenelytra (*Latreille*), and family Helopidæ. Generic characters:—Head broad; antennæ with the five terminal joints slightly serrated; body elongate. [HELOPIDÆ.]

CAMPSIE HILLS, in Scotland, extend between the lower courses of the rivers Forth and Clyde, in a general direction from E.N.E. to S.S.W. They occupy the middle portion of the county of Stirling and the S.E. part of that of Dumbarton. More than one-third of Stirlingshire is covered with the Campsie and the valleys belonging to them, but only a small part of Dumbartonshire.

The Campsie Hills are not connected with any mountain-range of Scotland. To the S. of them extends the plain, through the N. portion of which the Forth and Clyde Canal runs; and at their most western extremity they are separated from the hills of Renfrewshire, which terminate E. of Port Glasgow, by the wide and deep bed of the Clyde. They are separated from the mountains skirting the banks of Loch Lomond on the W. by the valley of the Leven. The mountains S.E. of Ben Lomond also are detached from them. From Buchanan, near Loch Lomond, a plain, with an average width of four or five miles, extends to the banks of the Forth, at Kippen. This plain, in its highest parts, is hardly more than 200 feet above the sea. Farther E., the valley of the Forth divides the Campsie Hills from the high summits in Perthshire and the S. extremity of the Ochill Hills.

The rock on which the Castle of Dumbarton stands, close to the Clyde, is the most S.W. extremity of the range; [illegible] the rock of Stirling Castle is its most N.E. point. At nearly an equal distance from both these rocks are the Campsie Fells, the highest portion of the system, which rise to more than 1500 feet above the sea. In these hills the sources of the Carron, the Endrick, and the Glazert are interlocked. From this point the Campsie Fells branch off W. and E., and continue about twelve miles in each direction, ending on the W. near Killearn. On the E. the range divides into two ridges, which enclose the valley of the Carron, till both terminate somewhat more than one mile above Denny. The southern ridge is the highest and rises in some points to 1350 feet; the northern, which is much lower, separates the valley of the Carron from the hills about the sources of the Bannockburn.

Where the sources of the Endrick and Carron are interlocked, a ridge branches off in a N.E. direction, and continues to the banks of the Forth, at Touch, a distance of about ten miles. The rocks of Craigf[illegible] and Stirling may be considered as belonging to it and constituting its extremity. This ridge, which is called Dundaff Hills, occupies in width as much space as the Campsie Fells, but its height hardly ever reaches 1000 feet.

At the source of the Glazert another ridge of high land branches off from the Campsie Hills, which for four or five miles runs S.W., but then declines to the W., in which direction it continues for about ten miles, till it terminates about a mile from the banks of the Leven, opposite Bonhill. These heights, which are called the Kilpatrick Hills, are much lower than the Campsie Fells and the Dundaff Hills, and hardly ever attain more than 700 feet. They occupy a considerable space, sending off offsets to the [illegible] and N. These offsets advance southward to the road leading from Dumbarton to Glasgow, where Chapel Hill and Dulnotter Hill are situated. The rock of Dumbarton is the most W. extremity, and on the other side of the Clyde, opposite it, begin the Renfrew Hills. On the N., the outsets of the Kilpatrick Hills advance to a short distance from Kilmarnock, near the mouth of the Endrick.

The descent of the Campsie Hills to the N. is everywhere gentle, and often terminates in moors; on the S. their declivity towards the plain is steep, and the streams are full of rapids and falls. The valleys within the range are rather narrow, rarely exceeding half a mile in width, except where they approach the open country which encloses the Campnical characters:—Antennæ not inserted close to the eyes, geniculated in the males, and furnished externally with long hairs. [XYLOPHAGI.]

CAMPTODO'NTUS (Dejean), a genus of coleopterous insects, of the family *Scaritidæ*, closely allied to *Oxyotomus*; from which genus however the present is distinguished by the species having the labial palpi shorter than the external maxillary: antennæ with the basal joint scarcely longer than the two following joints taken together. [SCARITIDÆ.]

CAMPUS MA'RTIUS, the name of a district outside the walls of antient Rome, between the Quirinal and Pincian Mounts and the Tiber. It is chiefly level ground, and little higher than the river. It was originally called Campus Tiberinus, but having come into the possession of Tarquinius Superbus, it was, after the expulsion of that king, consecrated to the god Mars, and became a suburban place of resort for the citizens, for whose diversion gardens, shady walks, a race-course, a naumachia, theatres, &c., were successively constructed. The election of the consuls and other magistrates was held in the Campus Martius in the time of Cicero, and much of the canvassing took place there. Under Aurelian, the walls of the city having been extended, the Campus Martius became inclosed within their boundary. It was included in the region called Circus Flaminius The name of Campo Marzo is now applied to one of the 14 Rioni or districts of modern Rome, which forms the northern part of the old Campus Martius, between the Pincian Mount and the Tiber, and includes the fine entrance into the city by the Porta del Popolo and that part of the Corso nearest to it, the Piazza di Spagna, where most foreigners reside, the Villa Medici, and the new gardens on the Pincian Mount, the port or quay of Ripetta, the palace Borghese, and the amphitheatre of Corea, which is used for bull-fights and fire-works, and which is built on the ruins of the mausoleum of Augustus. This district is the most bustling and lively, and one of the healthiest in Rome.

The name of Campo Marzo is also retained to denote a place in another district of the town, near Piazza Navona, where the palace Braschi and Pasquin's bust are, and which formed part of the antient Campus Martius.

CAMPYLOMY'ZA (Wiedeman), a genus of dipterous insects, of the family *Tipulidæ*. Generic characters:—Proboscis curved; antennæ filiform, fourteen-jointed, two basal joints tolerably thick, the remaining short, cylindrical, and covered with fine hairs; body short; femora elongated; wings hairy, with one marginal cell, and three posterior cells, the first and second divided by an indistinct nervure.

The species of this genus are all extremely minute, and found on the leaves of trees.

C. bicolor is less than one-twelfth of an inch in length, of a blackish colour, with the edges of the abdominal segments pale; [illegible] yellow. This species, and three or four others inhabit this country.

CAMPYLO'PTERUS. [HUMMING BIRDS.]

CA'MPYLUS (Fischer), a genus of coleopterous insects, of the family *Elateridæ*. The species of this genus are distinguished by their having the hinder part of the head free, or not sunk into the thorax as far as the eyes, as is usually the case in this tribe. The eyes are globular and projecting: the antennæ are rather long, obscurely pectinated, and inserted close to the eyes beneath a projecting frontal ridge; thorax narrow; elytra much elongated, and somewhat linear.

C. dispar, a common insect in this country, is found on the leaves of trees, and on nettles and other plants. It is nearly half an inch long, and of an ochreous colour, with the under part of the body more or less black: sometimes the posterior part of the head, the disc of the thorax and elytra, and the femora are black.

About six or seven species of this genus have been discovered, most of which are European. The above-described species is the only one known to inhabit England.

CAMUS. We insert this article principally to make the distinction between several mathematicians of this name.

1. François Joseph des Camus, born 1672, died 1732, author of 'Traité des Forces mouvantes,' 1722, and editor of Varignon's Mechanics, 1[illegible]5. He died in England, whither he had come in search of employment.

2. Charles Etienne Louis Camus, born 1699, died 17[illegible], was also concerned in the verification of Picard's de 1757.

3. Nicholas le Camus des Mézières, born 1721, died 1789, author of various works on architecture, his profession.

CAMWOOD (German, Kammholz; French, Bois de Cham; Portuguese, Pau Gabão), a red dye-wood, the colouring matter of which is similar to that of Nicaragua or peach-wood. It is used with alum and tartar as a mordant. It does not afford more than a third part of the colouring matter yielded by an equal quantity of Brazil wood. It is used likewise by turners for making knife-handles, and by cabinet-makers for ornamental knobs to furniture. The greatest part of the camwood imported into brought from Sierra Leone: the quantity imported into this country from that colony in 1832 was 835 tons; and in 1833, 917 tons: its value is about 22*l*. per ton. The duty on importation was reduced from 15*s*. to 5*s*. per ton in 1832, previous to which the importations did not average 400 tons in the year.

CANAAN. [PALESTINE.]

CANADA, divided into Lower and Upper Canada, is the most important British settlement on the continent of America. Its southern extremity is Point Pelée, or South Foreland, which extends to the S. of 42° S. lat. (near 82 70′ W. long.) No boundary having yet been fixed between Canada and the British possessions to the S. and W. of Hudson's Bay, it is impossible to assign its extent towards the N. It is however usual to consider all the countries north of the great lakes, which are drained by the rivers that fall into the St. Lawrence, as belonging to Canada; while those drained by the rivers falling into the Atlantic, or Hudson's Bay, are considered as portions of other divisions of the British possessions. Conformably to this notion, the most northern point of Canada lies between 52° and 53° N. lat., at some distance N. of the Lake of Manicouagan, near 65° W. long. The most E. point is Cape Gaspe, S.W. of the island of Anticosti, 64° 15′ W. long.; and the most W. extremity may be considered to be Fort William, on Lake Superior, or rather Goose Lake, which is situated at some distance from that establishment to the W.S.W., in 90° 20′ W. long.

Canada borders, on the W., N., and for the most part also on the E., on other British territories, and in these directions its boundary line is generally undetermined. On the S., and partly on the E., it is bounded by the United States of North America, the boundary being formed by a line drawn through the lakes Superior, Huron, Erie, and Ontario, and the passages which unite these lakes to one another. From the E. extremity of Lake Ontario, the boundary follows the course of the St. Lawrence, or as it is here called Cataraqui, till it is cut by the parallel of 45°. It then runs E. along this parallel, and across Lake Champlain, to near the sources of the Connecticut River, between 71° and 72° W. long.; and here it follows in a winding line the course of the mountains, which separate the water-courses falling into the St. Lawrence and St. John River from those that by a southerly course run through the state of Maine. The boundary line thus described terminates at Mars Hill, 46° 30′ N. lat., and 67° 10′ W. long.; but the United States claim a considerable tract to the N. of this boundary line. The meridian of 67° 50′ W. long. divides Canada from the British colony of New Brunswick till it meets the River Ristigouche, whose course separates both countries to its mouth in Chaleurs Bay.

The average breadth of Canada from S. to N. is about 300 miles, and the length from Lake Superior to the Island of Anticosti about 1000. This gives an area of about 300,000 square miles, or the whole of France and about one-third more; twice the surface of the British island and one-half more. This calculation is somewhat at variance with the statement that Upper Canada contains about 90,000 square miles; Lower Canada, 205,863; and the St. Lawrence River with its æstuary, 52,500: total surface, 348,363.

Nearly the whole of Canada is situated within the basin of the St. Lawrence River. All the tract to the N. of the lakes and of the river belongs to it, and also about one-third of that to the S. of the river. The other two-thirds S of the river include the countries drained by the upper course of the St. John River and its tributaries, which form the district claimed by the United States.

The N. boundary of the basin of the St. Lawrence coincides with the N. boundary of Canada, but on the S. it extends to a considerable distance into the United States of America, running from the W. extremity of Lake Superior to the most southern point of Lake Michigan, by a line describing a curve towards the point where both lakes approach nearest one another. From the most S. point of Lake Michigan it runs E.S.E. to the sources of the river Maumee, which empties itself into the most W. corner of Lake Erie: it then turns E.N.E. towards Lake Erie, and runs parallel to it at an average distance of 15 or 25 miles. So far the elevated land forming the margin of the basin of the river seems to be from 1000 to 1200 feet above the level of the sea. At the E. extremity of Lake Erie the range forming the boundary-line turns due E., and runs parallel to Lake Ontario; but here the distance from the lake varies from 60 to 70 miles, and the average elevation of the country is estimated at rather more than 1400 feet above the sea. This range, which up to 75° W. long. continues in that direction, E. of that meridian turns to the S. and joins the Catskill Mountains on the banks of the Hudson (near 42° N. lat.). Between the most N.E. extremity of this ridge of high land and another ridge which begins near 74° W. long. and 43° 20′ N. lat. on the S. shores of Lake St. George, the edge of the basin of the St. Lawrence is not formed by a ridge, but by a nearly flat country, which is not more than 500 feet above the level of the sea. Through this break the Great Erie canal in the State of York has been cut. [NEW YORK.] From the S. corner of Lake St. George the edge of the St. Lawrence basin runs first N. by E., but having approached to the distance of 70 miles from the banks of the river, it turns N.E., and runs parallel to its course up to 70° 20′ W. long., where it follows the mountain-ridge which extends from the origin of St. John's River northward till it approaches within 20 miles of the St. Lawrence. This distance it maintains on an average up to Cape Rozier, at the mouth of the wide æstuary of the river. The high land forming the edge of its basin east of Lake George is probably never less than 1500 feet above the level of tide-water.

The whole basin of the St. Lawrence is calculated by Darby to contain 537,000 square miles, of which

The upper basin, or that of Lake Superior, contains	90,000
The middle basin, terminating at the great falls of the Niagara	160,000
The lower basin, to the mouth of the St. Lawrence	287,000
	537,000

Of this area, about 149,000 square miles are covered with water, not including in the calculation the smaller lakes, and taking into the account only the five larger and the St. Lawrence, with its wide æstuary.

Lake Superior covers	43,000 sq. m.
Lake Huron	16,500
Lake Michigan	13,500
Lake Erie	10,900
Lake Ontario .	12,600
River St. Lawrence, and its wide æstuary	52,500
	149,000

According to this calculation, there remain 386,000 square miles, of which about 270,000 square miles belong to Canada, and 98,000 square miles are included in the United States of America.

Lake Superior, the true source of the St. Lawrence, is the greatest fresh water lake on the globe, measuring on a curved line drawn through the centre more than 400 miles in length; its extreme breadth is 175 miles, and its circumference, following the sinuosities of the coast, about 1740 miles. Its surface, according to a rough calculation, is above 43,000 square miles, or about 7000 miles less than England. Its surface is 627 feet above the tide water in the Atlantic; but its greatest depth descends below it, being 792 feet. When its surface is agitated by storms it resembles the ocean. It is subject to a considerable rise at the time of the spring-freshes, especially after a rigorous winter. The heights which enclose its basin are at some places 50 or even 70 miles distant, in others they approach near and form the very margin of the lake. The rivers which fall into it are not long, but th of 50 of some size, and several are broad In general they are not navigable, or on tance, as they descend in their short cou which are from 500 to 614 feet above the Louis, which enters at the extreme S.W. channel of communication with the Upper Mississippi; it rises 551 feet above the lake. Along its N. [illegible]es the rocks are from 300 to 1500 feet high, and would render the navigation dangerous during a gale but for the numerous small islands near the entrance of inlets and bays, in which vessels find shelter. The country is dreary, and almost without trees or vegetation; the climate is cold, and game and esculent plants exceedingly scarce. Along the S. shore of the lake extends a low sandy beach, intersected with rocks of limestone, rising 100 feet above the surface of the water. The navigation is dangerous in this part, owing to there being no bay on the whole extent of the coast. Islands only occur along the N. shore and towards each extremity of the lake. The largest, called Isle Royal, is said to be 100 miles in length by 40 in breadth, but on our maps it has not half these dimensions. The waters accumulated in Lake Superior are carried off by a river issuing at its most eastern angle, called St. Mary's River or Strait. About 12 or 15 miles from the lake it forms the rapids of St. Mary, which are produced by a great mass of water forcing its way through a confined channel. The rapids are nearly two miles long, and have altogether a fall of 22½ feet perpendicular height. Canoes sometimes venture to descend the rapids, but they are generally avoided by a portage about two miles long, which connects the navigable parts of the river. As far as the falls the river runs E., but below them it turns to the S.E., and dividing into several channels encloses numerous islands, of which the most considerable are Sugar Island, St. Joseph, and Drummond; the two former belong to Canada, and the latter to the United States. This part of the river is navigable for boats and sailing-vessels of six feet draught. Above the Island of Drummond the river widens, and soon enters Lake Huron, after a course of above 40 miles, in which it falls 32 feet, the rapids included.

Lake Huron is only second to Lake Superior in extent, its greatest length in a curved line between St. Mary's Strait and its outlet being above 240 miles. From S. to N. it is 186 miles. Its extreme breadth, which lies nearly W.N.W. and E.S.E. is about 220 miles; its circuit exceeds 1000 miles. The surface is 595 feet above high water the Atlantic; and its greatest depth exceeds 450 feet. is divided into two unequal portions by a series of islands, called Manitoulin Islands, and by a peninsula, called Cabot's Head. The Manitoulin Islands begin on the E. of Drummond's Island in the very mouth of St. Mary's River, and extend E. with an inclination to the S. for 120 miles. One of them, Great Manitoulin, is upwards of seventy-two miles long, and varies in breadth from three to twenty-three miles, being singularly indented by inlets and coves, which give it a very irregular and broken outline. Its name is derived from the language of the Indians, who consider it as the dwelling of the Great Spirit, or 'Manitou.' These islands are divided from Cape Hurd, the northern extremity of the peninsula of Cabot's Head, by a strait about ten miles wide, which contains a few small rocky islands. Cabot's Head projects from the S. shores of the lake, about fifty miles into the lake, with an average width of twelve miles. That portion of the lake, which is thus separated from its main body, is called Georgian Bay, and measures in length from the most S. point of Natawasauga Bay to St. Mary's Strait about 225 miles. Its S. portion E. of Cabot's Head has an average width of fifty miles, and lies S.S.E. and N.N.W.; but between the Manitoulin Islands and the N. shores of the lake it does not exceed seven or eight miles, and sometimes contracts to three. At Natawasauga Bay the shores are high, but the lake is free from rocks. Farther N. the shores are much indented, and fringed by a multitude of small islands and rocks. The main body of Lake Huron contains very few islands, and is generally of great depth. The shores of Lake Huron, opposite the Manitoulin Islands, are elevated and broken, especially between 81° and 82° W. long., where there is a bold ridge of hills, called Cloche Mountains, extending about forty miles along the coast, and exhibiting distinctly three or four elevated summits. Farther to the S.E., clay cliffs, rolled stones, abrupt rocks, and woody slopes of various elevations, from

30 to [illegible] constitute the shores as far as Cabot's H[illegible]is peninsula exhibits nearly the same character; b[illegible]try above those heights is supposed to be of ex[illegible]ty. From Cabot's Head to the outlet of the lake, the shores are in general low, or of very moderate height. The W. shores of the lake do not rise to a great height; [illegible] form nearly in the middle a deep and wide inlet, [illegible]naw Bay, which is sixty miles long by twenty wide. Among the rivers falling into Lake Huron three are remarkable—the Francis, the outlet of Lake Nipissing, the Muskoka, the outlet of the lake of that name, and the Severn, which issues from Lake Simcoe.

At its N.W. extremity this lake is united to Lake Michigan by the strait of Machillimakinac, which is only six miles long and eight wide. Lake Michigan is nearly 300 miles long, with an average width of seventy-five, and very deep. Its form is elliptical and regular, except a break in its W. coast, which forms the Green Bay, and is said to extend 100 miles parallel to the lake, and another inferior bay on the opposite side, called Grand Traverse Bay. Its shores are everywhere of a moderate height. This lake is entirely surrounded by the territories of the United States.

The river St. Clair issues from the S. point of Lake Huron, and runs thirty miles between moderately high banks, till it expands into Lake St. Clair, which is about thirty miles in diameter, and shallow, but has sufficient depth in its channel to admit steam-boats and schooners; and the same is the case with the river St. Clair. The shores of the lake are low and level; and it receives from the E. two considerable rivers, the Great Bear River or Creek, and the Thames. Issuing from the S.W. angle of Lake St. Clair the river is called Detroit. It first runs W., and then bends in a regular curve about due S. to its influx into Lake Erie. Its length is twenty-nine miles, and it is navigable for such vessels as are employed upon the lakes, being from seven to eight feet deep. At Amherstburgh, near its mouth, is an excellent harbour. The banks of the river are moderately elevated: the fall between Lake Huron and Lake Erie is thirty feet.

Lake Erie is 265 miles long, and 63½ broad at its centre: its circumference is computed at 658 miles; and its surface is 565 feet above sea. Its greatest depth is about 100 feet, with a rocky bottom. The navigation on this lake has rapidly increased since the Great Erie Canal in the State of New York and the Welland Canal in Canada have been formed; but several circumstances combine to render it tedious and dangerous. A constant, and when calm, a very perceptible current runs down the lake, which, added to the prevalence of S.W. winds, retards the progress of vessels which are proceeding W.; and their course is rendered still more intricate by several elongated points which stretch from the N. shore into the lake. The most conspicuous are Point Pelée or South Foreland, Point aux Pins or Landguard, Long Point or North Foreland, and Point Abino. There is also a want of deep harbours, especially on the low and level northern shores. The S. shores belonging to the United States are also in general low, except between Cleaveland and the mouth of the river Huron, where the cliffs rise almost perpendicularly nearly sixty feet above the water-level. This shore has some harbours for small vessels, such as the mouth of the Cattaraugus, Presquile, and the bays of Sandusky and Miamee. The small islands at the W. end of the lake have also in some places good anchorage and shelter for small vessels; and on Cunningham's Island, which belongs to the United States, there is a fine harbour called Put-in-Bay, which has twelve feet of water, and is well sheltered. The basin of this lake does not receive any great river, except at its W. and E. extremities. At its W. end it receives the Detroit and the Miamee, which flow in the territories of the United States; and at its E. end the Ouse or Grand River, whose mouth makes the best harbour on the N. shore.

The waters of Lake Erie descend to Ontario by the Niagara River, which commences at the extreme N.E. point of Lake Erie, and runs thirty-three miles and a half, measured along its course, in a general direction from S. to N. Its breadth varies from half a mile to one mile and more. It divides several times into two branches, including some islands; of which the largest, Grand Isle, belonging to New York, contains 11,200 acres. Below this island the river is above one mile wide, and turns to the W., in which direction it flows to the Great Falls, three miles and a half distant. These cataracts are twenty miles from the beginning of the river. In this distance its waters fall sixty-six feet, of which they descend fifty-one feet in the space of the half mile immediately above the falls, so that the river is navigable to the village of Chippowa. The Great Falls are formed where the river suddenly turns to the N.N.E. Above the falls the banks of the river are very little elevated above the water's edge; but below the falls the current flows rapidly in a bed several hundred feet deep, and walled in on both sides by perpendicular rocks. The cataract consists of two falls, divided from one another by a small island, called Goat Island. The fall on the American side is 162 feet high, and 375 yards wide. The fall on the Canadian side is 700 yards wide, and 149 feet high. The face of Goat Island measures 330 yards. The whole breadth of the river at this point is 1465 yards. Five miles lower down is a very strong eddy, called the Whirlpool; and five miles below it, the river emerges from the rock-bound chasm, and flows in a deep and gentle current between banks of moderate elevation. At some very remote period, the falls were probably much farther to the N., between the villages of Queenstown and Lewistown, but the rocks have gradually given way to the continual friction of the rapid current, and receded to their present situation. As more than one-third of the Niagara is not navigable, the navigation of Erie and Ontario has been united by the Welland Canal.

Lake Ontario extends nearly W. and E. in an elliptical shape, measuring in length 172 miles, and in extreme width nearly sixty: its circuit is stated to be 467 miles; the depth varies from three to fifty fathoms, except in the centre, where it sinks to 100 fathoms. Its surface is 234 feet above the tide-water in the Atlantic. Its shores round the W. end are of moderate height, but they rise higher E. of the town of York, where they assume a lofty character, but subside gradually as they approach the peninsula of Prince Edward. The remainder of the Canada side up to the beginning of the river Cataraqui is low, and in many places marshy. The southern shores are, in general, low or very little elevated, and are destitute of harbours, except at the E. end of the lake, where there is a good harbour at Sackets. The Canadian shores have in this respect the advantage, possessing two excellent harbours for vessels of a middling size at York and Kingston: the Bay of Quinté also affords at several places excellent anchorage. Two large rivers fall into the lake from the S., the Genessee and the Oswego or Onondaga; on the northern side the Trent falls into the Bay of Quinté. There are some small islands at the E. extremity: the largest is Wolfe Island, opposite Kingston, at the efflux of the Cataraqui or St. Lawrence, by which two channels are formed leading to the river; the northern channel is called the Kingston Channel, and the S. the Carleton Channel.

The St. Lawrence issues from Lake Ontario by the two channels which surround Wolfe Island, but in this part it has not the name of St. Lawrence, which is properly only applied to its course below Montreal, that above Montreal being called Cataraqui. The part of the river immediately below Wolfe Island has the appearance of a lake, from two to ten miles wide, with a very gentle current. It is studded with a multitude of small islands varying greatly in extent, shape, and appearance, whence it is called the Lake of the Thousand Islands. The number of these islands is 1692. The lake extends to about 40 miles from Lake Ontario, when the channel gradually becomes narrower and the current imperceptibly increases, but continues gentle down to Fort Wellington. Some miles below this place a series of rapids commences, which is almost uninterrupted to the head of Lake St. Francis, immediately below 45° N. lat. The greatest impediments to navigation occur between Johnston and Cornwall, where the river in 39 miles falls 75 feet, and very violent rapids are formed by the heavy volume of the waters. It is however navigated by boats of from six to fifteen tons, and six years ago it was stated that 10,000 tons were employed in this navigation.

The lakes of St. Francis and St. Louis, which follow, are only expansions of the river. The former is 25 miles long by 5¼ where widest. Lake St. Louis, which is formed by the junction of the Utawas or Ottawa river with the Cataraqui, is 12 miles long and six broad at its greatest width. Between them lie the Cascades, where the great volume of water is impetuously pushed towards some rocks, and repelled by them, so that large round waves are formed, which produce an agitation in the waters resembling that of the most furious tempest. To avoid this dangerous place a small canal has been made across a point of land near Le Buisson, 500 yards long, and furnished with the necessary locks: it is called the Military Canal. At the junction of the Ottawa and Lake St. Louis there are four considerable islands formed by the different channels of the river, Montreal, Isle Jesus, Bizarre, and Perrot, of which Montreal, the largest, contains the town of Montreal. The principal channel runs between the island of Montreal and the S. bank, first due E. and afterwards nearly due N. Where it turns to the N. there is a beautiful rapid, called Sault St. Louis, which is very dangerous and almost impassable for boats and vessels, on account of the great rapidity of the current. A canal has been cut through the S. E. part of the island of Montreal, which is rather more than eight miles long, extending from the village of Upper Chine to Montreal. This canal, called La Chine, is 48 feet wide at the surface, 28 at the bottom, and 5 feet deep. The Sault St. Louis is the last considerable impediment in the navigation of the St. Lawrence.

Though Montreal is 580 miles from the Gulf of St. Lawrence, vessels of 600 tons get up to it with very little difficulty. Below Montreal the width of the river varies from three to four miles till it expands into Lake St. Peter, which is 25 miles long, and above nine miles wide. Groups of islands cover about nine miles of its surface at its upper end, and farther down shoals stretch from both banks, which are low, far into the lake, so that only a narrow passage from 12 to 18 feet deep is left in the middle. About 10 miles from the lower end of this lake, the St. Lawrence is joined by the river St. Maurice, near the town of Three Rivers, where the tides are sometimes perceptible, though they are generally not much felt for several miles farther down. Three Rivers is 432 miles from the head of the island of Anticosti.

Richelieu Rapid, the last in the St. Lawrence, occurs 52 miles below the Three Rivers. The bed of the river is here so much contracted and obstructed by rocks that it leaves only a very narrow channel, in which at ebb tide a rapid is formed that cannot be passed without great care. But when the ocean swell is at its height the rapid disappears, as the tides rise here from 15 to 20 feet. At Quebec the river is only 1314 yards wide, but it soon expands considerably, and continues increasing in breadth till it enters the Gulf. At the mouth of the river Saguenay it is 18 miles across, and at Cape des Monts or Mont Pelée 25 miles: but here the N. bank trends suddenly almost N., so that at the seven islands both banks are 73 miles apart. The distance between Cape Roziere and Mingan settlement on the Labrador shore is very near 105 miles. This may be considered as the embouchure of the St. Lawrence. Its waters begin to be brackish 21 miles below Quebec, and they are perfectly salt at Kamouraska, 75 miles lower down. Several islands occur in the lower and wider course of the river, of which the largest is the island of Orleans, about 10 miles below Quebec, which is about 18 miles long, 5 wide, and well cultivated. At the mouth of the river is the large island of Anticosti.

If we consider Lake Superior as the true source of the St. Lawrence, the course of the river is between 600 and 700 miles shorter than that of the Mississippi, as the following table shows:—

Lake Superior, along a curved line drawn through its centre	400
Straits of St. Mary	40
Lake Huron, also along a curved line through its centre	240
River St. Clair	30
Lake St. Clair	30
Detroit River	29
Lake Erie	230
River Niagara	33
Lake Ontario	155
St. Lawrence, up to Cape Roziere . . .	692
	1859

The upper branches of the rivers falling into the great lakes or the St. Lawrence are said to be divided from those falling into Hudson's Bay by the chain called the Land's Heights but we are little acquainted with that part of the country, and it is not improbable that it may turn out that no such chain exists, and that here, as in other parts of North America, the rivers have their origin in lakes which lie in a plain of a nearly level surface, and are situated at nearly the same elevation above the level of the sea.

That part of Canada to the N. of the great lakes and the river St. Lawrence may be divided into three sections. The most western comprehends the country of Lake Superior and the N. shores of Lake Huron, and is divided from that farther E. by the range of mountains called La Cloche, which commence opposite the E. extremity of Grand Manitoulin Island, and extend farther N. than they have been explored. This part of Canada is very little known, and contains no European settlement, except a few establishments for the fur-trade. It seems to be a table-land of considerable elevation, the surface of which is often slightly broken and covered with small hills, but in other parts spreads out in extensive levels. It is full of small lakes, and is traversed by a great number of small rivers; in some places it is covered with extensive swamps. Being generally well wooded it is probably fertile.

The middle section extends from the La Cloche mountains E. to the Ottawa, and comprehends all the countries W. of that river, and also the peninsula which lies between the lakes Huron, Ontario, and Erie, and terminates at the rivers St. Clair and Detroit. It embraces, consequently, the whole of what is now called Upper Canada, and a small portion of Lower Canada. The surface of this section comprises a table-land of a somewhat uneven surface, two extensive terraces, and a level plain.

The table-land comprehends the northern part of the country, and about half of the whole; its southern edge is marked on the W. by the rise in the country between Lakes Simcoe and Muskoka. This acclivity continues eastward, at a distance of about 20 miles S. of 45° N. lat., and may be considered as terminating a little E. of the meridian of 77°. A line running due N. near this meridian separates it from the country farther E. From the shores of the Georgian Bay the country rises rapidly to a considerable height; that portion of the table-land E. of Lake Huron is 750 feet above the lake, and 1344 feet above the sea. This height, or one somewhat lower, may be considered as the average elevation of the table-land. Its surface is probably not very irregular, except towards the banks of the Ottawa, where it is broken by extensive valleys, running parallel to the river, and considerably depressed below the surface of the table-land. About the middle of this elevated country is a depression which contains numerous lakes, united by two rivers, of which one called Nesswabic runs N. and afterwards E. and joins the Ottawa, and the other, called Muskoka, runs first S. and then W.: and after having traversed the Trading Lake and Lake Muskoka, and formed several rapids, empties itself into the Georgian Bay. Towards the N.W. boundary is Lake Nipissing, which is above 50 miles in diameter, and is 750 feet above the sea. From its S. extremity issues a river called Francis, which forms several rapids before it enters Lake Huron. As far as this table-land has been explored it appears to be generally covered with forests of hard wood, and to have a fertile soil. It is still entirely in possession of the native tribes, among which the Mississagua are the most numerous.

The Ottawa, which bounds this country on the E., issues from Lake Temiscaming, but its remotest branches rise nearly 100 miles beyond that lake. Its upper course is only visited by traders in fur and timber. The first European settlement is at Lake Allumettes, not far from the place where the Nesswabic enters the lake. In this part the Ottawa, divided into two channels, surrounds an island, called Black River Island, which is about 15 miles long, by an average breadth of four. The upper course of this river consists only of a series of lakes, connected by short channels, which always exhibit rapids or falls. Farther down is the Grand Calumet Island, which is about 20 miles long, and 7 miles in its greatest width. Both the channels which enclose it are full of rapids. At the lake Des Chats the Ottawa is joined by the Madawaska, which descends from the table-land by a course of about 100 miles. Lake Chaudière is 18 miles long, with an extreme breadth of 5 miles; at the lower end of this lake commence the falls called Chaudières, or kettles, from their form, the principal of which is 60 feet high. Below these [illegible] Ottawa is navigable for steam-boats to Grenville, a distance of sixty miles; and in this part of its course the banks of the river, which so far are generally high, subside so much that the adjacent country [illegible] in spring and autumn for more than a mi... Grenville is the rapid called Long Sault. At Point F ne the Ottawa gradually begins to e[illegible] into a lake, called Lake Two Mountains, which joins the St. Lawrence where it forms the lake St. Louis, above Montreal. To avoid the rapids between Grenville and the Lake Two Mountains some cuts have been made along the river on its N. bank, which are called Grenville Canal: they have the same dimensions as the canal La Chine. Thus the Ottawa is navigated up to Bytown and the Chaudière Falls, a distance of above 100 miles. The course of the Ottawa from Lake Temiscaming to Lake Two Mountains is about 350 miles.

The country bounded by the lower course of the Ottawa and the Cataraqui rises with gentle acclivities in the form of terraces from the banks of both rivers. In the E. districts the highest land extends at no great distance from the Cataraqui; but N. of the Lake of the Thousand Islands it turns to the W., and continues in that direction till it joins the table-land, near 77° W. long. This ridge is probably not more than 700 feet above the sea: it is lowest at its western extremity, where it occupies a greater space, and encloses a number of lakes, the greatest of which are the Rideau and Mississippi lakes. Some portions of this country are marshy, but in general the soil is fertile, and agriculture is rapidly advancing.

The comparatively small elevation of the western districts has suggested the formation of a canal between Lake Ontario and the Ottawa. This canal is called the Rideau Canal, from its passing through the lake of that name: it is 135 miles long, beginning at Kingston on the shores of Lake Ontario, and terminating at the foot of the Chaudière Falls. Lake Rideau, which is about 24 miles long, and 6 miles wide on an average, is the summit-level of the canal, from which it descends 283 feet to the Ottawa river, and 154 feet to Lake Ontario. On the N. side of Rideau Lake are 30 locks, and on the S. side 17. The locks are 142 feet in length, by 33 in width, the depth being 5 feet, so that sloops and steam-boats from 100 to 125 tons can navigate the canal.

The country between the table-land and Lake Ontario forms two distinct terraces, which extend from E. to W.: they are divided from one another by a ridge of hills, which begin between 77° and 78° W. long., near the W. end of the Bay of Quinté, about 8 or 9 miles from the shores of Lake Ontario, and run W. nearly in a straight line, under the parallel of 44°. As they proceed farther W. they are farther from the lake, so that opposite the town of York the plain along the shores of the lake is 24 miles wide, and where the ridge terminates, near 80° W. lat., it is still wider. Between this ridge and the S. edge of the table-land is the upper terrace, which is much larger. At the E. extremity it extends to the shores of the Bay of Quinté, and farther W. the southern range remains always about 50 miles distant from the S. edge of the table-land; its length is about 150 miles. Both terraces are divided from the low plain, which extends farther W. between the lakes of Huron and Erie, by a ridge of hills which begins on the N. on the shores of Natawasauga Bay, and runs S. to the W. end of Lake Ontario, where it forms the Burlington Heights, and continues along the shores of Burlington Bay, and the S. side of Lake Ontario, at a distance not exceeding from 4 to 8 miles. Near Queen's-town it reaches the Niagara river, where it forms the great falls. It continues in an E. direction through the State of New York to Lockport, where it is about 12 miles from Lake Erie. It afterwards crosses the Great Erie Canal, runs parallel to it, and subsides at Rochester, on the Genessee river.

The northern and larger of the terraces seems to rise gradually from E. to W. In its western district is Lake Simcoe, whose surface covers 800 square miles, and is at least 100 feet above Lake Huron, and 468 above Lake Ontario. From its N. shore issues a considerable river, called the Severn, which empties itself into an inlet of Lake Huron, called Gloucester Bay. The country between Lake Simcoe and Balsam Lake, which lies farther E., probably rises nearly 800 feet above the level of the sea. Balsam Lake receives a river which descends in a S.W. direction from the table-land, but is very little known. The lake may be considered as the source of the river Trent, which running E. unites the lakes Sturgeon, Pidgeon, Shemong, Shibauticon, and Trout, all of which lie on the northern border of the terrace, and extend several miles from S. to N. Issuing from Trout Lake, the river runs with many windings S., and reaches Rice Lake by a bold bend to the E. This lake, which is 25 miles long, and from 4 to 5 miles wide, lies S.W. and N.E., and only 15 miles from Lake Ontario. The Trout leaves the lake at its N.E. extremity, and continues in that direction for about 30 miles, when it turns E., and soon afterwards S.W. It changes again its course to the E., and afterwards to the S., till it falls into the Bay of Quinté. It is stated that this river is navigable for boats in all its extent, which is somewhat surprising, as its source is more than 450 feet above its mouth, and its course in a straight line falls short of 100 miles, and measured along its windings cannot exceed 300 miles. The execution of the projected water-communication between the lakes Ontario and Huron, by means of this river and Lake Simcoe, is rendered difficult by the numerous rapids of the Severn.

The Bay of Quinté, into which the Trent falls, is only long, irregular, and winding lake, divided from Ontario by the peninsula of Prince Edward. Its length, measured along its windings, is near 50 miles, and its breadth varies from 6 to 12. The isthmus by which it is divided from the lake, is, at its W. extremity, only 3 furlongs wide. The peninsula of Prince Edward is indented on every side by numerous small bays and coves, offering anchorage and shelter for such vessels as navigate the lakes.

The soil of the upper terrace, so far as it is known, is fertile, and contains very few sterile tracts, except several swamps of moderate extent. The whole is still covered with wood and high forest trees, the European settlements being few, and at great distances from one another. Iron ore is abundant, and begins to be worked.

The southern and more narrow terrace, which terminates in rather a high shore on Lake Ontario, and extends between the peninsula of Prince Edward and Darlington, is rather level, and in general extremely fertile, with the exception of a sandy plain between Ontario and Rice Lake: to the W. of Darlington the soil along the lake is of an inferior quality. Though the number of European settlements is rather considerable in this district, at least in comparison with those farther N. and W., by far the larger portion of its surface is still covered with wood.

The plain of Upper Canada comprehends the peninsula which extends between the Lakes Erie and Huron, nearly in the form of an equilateral triangle, whose base is formed by a line drawn from Fort Erie, on the inlet of the river Niagara, to Cape Hurd, the N. extremity of Cabot's Head, a distance of 216 miles. Another line, cutting it at a right angle and striking Detroit river at Amherstburg, is about 195 miles long. All this tract, which contains about 20,000 square miles, is level, or slightly undulating, except on its E. side, where it borders on the hills which separate it from the terraces. About the sources of the Thames indeed it appears to contain some rising ground, the upper plain of which is a kind of swamp or moor. The whole tract is an alluvial soil of great fertility, containing neither stones nor gravel. Most of it is covered with large forests of maple, beech, oak, basswood, ash, elm, hickory, wallnut, butternut, chestnut, cherry, birch, cedar, and pine. In the midst of these woods, and sometimes on the banks of the rivers, there are prairies, or natural meadows, of no great extent, generally covering only a few thousand acres, and containing on them small clumps of lofty pines, white oak, and poplar, scattered here and there. The largest of these prairies are in the neighbourhood of Long Point and the rivers Thames and Ouse.

The largest river of this plain is the Thames, whose sources are in the great swamp which occupies the centre of the country. Its upper course is N. and S., as far as London, whence its general direction is S.W. It discharges itself into Lake St. Clair, after a winding course of nearly 150 miles. It is navigable for vessels as far as Chatham, 15 miles from its mouth, and for boats nearly to its source; but it has a bar at its entrance.

The Ouse, or Grand River, rises in the hills S. of Natawasauga bay, about 30 miles from it, and runs with a very winding course, first about 75 or 80 miles S. and then nearly the same distance S.E. till it falls into Lake Erie at Sherbrooke. It has more water than the Thames, and is 900 yards wide at its mouth, but the bar across its entrance has only eight feet of water on it. Nevertheless it forms one of the best harbours on the N. shore of Lake Erie. The river is navigable about 25 miles from its mouth for schooners, and considerably farther up for large boats.

The Welland, or Chippeway, which rises between the W. end of Lake Ontario and the banks of the Ouse, runs E. and falls into the river Niagara, nearly three miles above the great falls. For more than 25 miles from its mouth its depth varies between 9 and 15 feet. It has given its name to the canal which unites the Lakes Erie and Ontario.

The Welland canal begins in the Ouse, about two miles above its mouth, and crosses an extensive marsh, called Wainfleet marsh; it is then raised by seven locks to the level of Welland river, in whose bed it continues for 10 miles. It then descends by 32 locks in succession, from the summit of the Queenstown heights to their base. The canal is 42 miles long, 16 between the Ouse and Welland, 10 along the Welland, and 16 from this river to Lake Ontario. It is 56 feet wide at the surface, 26 at the bottom, and 8½ feet deep. The chambers of the locks are 100 feet in length by 22 in breadth, so that vessels of 125 tons can pass through, which is above the average tonnage of the trading vessels on the lakes. The canal may also be entered by the rivers Niagara and Chippeway, the Niagara being navigable to the mouth of the Chippeway.

Lower Canada comprehends, on the N. of the St. Lawrence river, the countries E. and N. of the Ottawa, with a small district lying E. of its mouth, and on the S. those extending from the parallel of 45° to Cape Gaspe. We shall first describe the country N. of the St. Lawrence.

About 30 miles below Quebec is Cape Torment, in the neighbourhood of which a mountain rises to the height of 1890 feet above the sea. A line drawn from this point at right angles to the river divides the northern countries into two portions, which are different in features and character.

Between the mouth of the Ottawa and Cape Torment the banks of the St. Lawrence are low, or of very moderate elevation, as far as Richelieu Rapid, 52 miles below Three Rivers; but from this point they begin to rise and assume a bold character, which continues increasing to Cape Diamond, on which Quebec stands, and still more towards Cape Torment. Where the banks are low, the adjacent country from 5 to 15 miles inland is level, or rises gradually to slightly elevated terraces. Beyond this level the country rises in moderate hills with gentle slopes: the width of this tract varies as the range of hills behind it approaches nearer or recedes farther. This range begins on the banks of the Ottawa near Grenville and runs nearly parallel to the St. Lawrence in a N.E. direction, leaving between it and the banks of the St. Lawrence a tract from 20 to 40 miles wide. In the parallel of Quebec it turns E. and covers the country about that town with numerous hills, which are divided from one another by fine valleys. Thus the country assumes a different aspect in those districts where the banks of the river begin to be high and bold. The soil of this tract along the river is generally good, but there are some districts where it is of inferior quality, especially in the neighbourhood of Three Rivers. It is said however that it improves farther inland, and of late years settlements have been formed at greater distances from the banks of the St. Lawrence. This country, though comparatively thinly inhabited, is more populous than Upper Canada.

The country behind the range of mountains has only been explored along the course of a few rivers. It appears to contain very few tracts fit for agriculture in the narrow river valleys. The intervening spaces are occupied by ranges of high and bare rocks which contain numerous small lakes and swamps. The trees which cover a part of its surface do not exhibit a vigorous vegetation.

The larger rivers have their origin to the W. of the mountain-range, break through it, and fall into the St. Lawrence. Those which join it to the S. of the Richelieu Rapid are navigable for 20 miles and upwards from their mouth, but are obstructed by rapids and cataracts higher up. The rivers which discharge themselves into the St. Lawrence N. of Richelieu Rapid are too rapid to be navigated; they are used in the spring to float down the timber to the mills situated near their mouth. This is particularly the case in the country about Quebec, which is considerably elevated above the level of the St. Lawrence.

The largest of these rivers is the St. Maurice, whose upper branches rise far in the interior behind the mountain-range. They are three in number and each of them passes through a considerable number of large lakes. They unite near 48° N. lat., from which point the river runs in a S.E. direction with numerous bends to its mouth near Three Rivers, a course of above 150 miles. It is navigable to La Tuque, about 100 miles from its mouth, but there are some rapids which must be avoided by short portages. The depth of this river is inconsiderable.

The country extending N.E. from Cape Torment is almost entirely unknown, except the valley of the river Saguenay. The coast has a forbidding appearance. From Cape Torment the ridge continues unbroken, except by the beds of rivers and rivulets, until it lowers 15 or 18 miles below the mouth of the Saguenay. It rises from the water-edge with a steep ascent to an average height of 300 or 400 and in some places 2000 feet. Farther down it subsides in approaching the Bergeronnes, and sinks to a moderate elevation at Portneuf, about 40 miles below the mouth of the Saguenay. But towards Pointe des Monts the banks rise again, and continue at a great elevation to the boundary of Labrador. The interior is only known by the information obtained from the natives, who describe it as consisting of rocky cliffs and rugged hills of inconsiderable elevation, dispersed over barren plains, and with thick forests studded with crooked and stunted pines, birch, firs, and cedar. Small lakes and swamps abound over the whole tract.

The Saguenay issues from Lake St. John, which covers about 510 square miles and receives several large rivers, of which the Wiatshuan and the Assuapmoussoin are the most considerable, but their course is very imperfectly known. Around Lake St. John are some tracts of cultivable land. Two rivers issue from the E. part of the lake, called the Grande and Petite Discharge, and unite after a course of about 40 or 50 miles, forming an island 38 miles long with an average breadth of 17. After their junction the river is called Saguenay, and runs nearly 100 miles to its mouth near Tadoussac. This river is bounded by banks of great elevation, formed of rocks rising from 200 to 1000 feet in height. Its current is very quick, though its depth is great: it is navigable for vessels of any size for about 70 miles to Ha-ha Bay, which is a good harbour. The tide ascends to the union of the two Discharges, and rises about 15 feet. The mass of water which is brought down by this river excites the surprise of every one who sees it.

In the south section of Lower Canada there is a mountain-range at the sources of the Connecticut river, on the boundary line between Canada and the United States, which runs in an E.N.E. direction to the origin of the St. John river. Here it divides into two chains: one runs nearly due E. and divides the waters falling into St. John from those flowing to the Kennebec and Penobscot in Maine, and terminates at a short distance from the banks of the St. John river with Mars' Hill. The other ridge runs nearly due N. till it approaches the St. Lawrence river within about 20 miles. It then turns N.E. and continues in that direction parallel to the river, its rocky heights often advancing to the very edge of the water. Its width up to 69° W. long. may be about 20 miles, but to the E. of Lake Temiscouata it grows wider till it occupies nearly the whole of the peninsula of Gaspé, towards its termination in the capes Roziere and Gaspé. By these mountain-ranges the country is divided into three regions, one lying to the W. of the mountain-range which runs N., and the second forming the narrow tract along the St. Lawrence, and the third comprehending the basin of the St. John river.

The western districts of the first region form an almost level plain, on which, at considerable distances, a few isolated mountains rise abruptly above the surface. The summit of Rouville Hill is 1100 feet above the level of the St. Lawrence. This flat country extends almost to the river St. Francis. But toward the S. the surface begins to swell gradually into ridges, becomes progressively more hilly, till it assumes a mountainous character towards the lakes of Memphramagog and St. Francis. The districts E. of St. Francis river have a hilly and broken surface of moderate elevation. The banks of the St. Lawrence are low, and partly marshy, especially so on the shores of Lake St. Peter; but lower down they gradually begin to rise, and at the mouth of the Chaudière they are high and bold, and continue so to Point Levy, opposite Quebec. The western level districts have the best soil in Lower Canada, from which wheat is exported to Great Britain. This is probably the most populous and best cultivated part of Canada. Between the St. Francis and the Chaudière, the soil varies very much in fertility, and large portions of it are still covered with forests. The course of the rivers which drain this country is less broken and rapid than on the north side of the St. Lawrence, and most of them may be navigated by boats and canoes, though in several of them the navigation is interrupted by rapids. The most important are the Chambly, St. Francis, and Chaudière.

The Chambly, also called Richelieu, St. John, St. Louis, and Sorel, the largest of the rivers of Lower Canada [illegible] fall into the St. Lawrence from the S., rises in Lake [illegible] in New York, which lake is united by a short passage to Lake Champlain. Issuing from Lake Champlain, the Chambly is a wide river, but it grows gradually narrower as it proceeds N., so that at its mouth it is only 250 yards broad, while near Lake Champlain its width exceeds 1000 yards. The upper course is rather violent, and at some places broken by rapids; lower down, its current is regular and gentle. It is navigable for decked vessels 12 or 14 miles from its mouth, and to Lake Champlain for boats and canoes. From St. John there is a ship navigation to the [illegible] m Lake Champlain. By this river the produce of the state of New York contiguous to Lake Cham[illegible] brought to Montreal. At the mouth is the town of [illegible] n Henry, or Sorel. The course of the Chambly in Canada is above 80 miles.

The St. Francis rises in the lake of St. Francis, which is about 18 or 20 miles long, and very irregular in breadth. The river issues from its W. side, and runs about 70 miles S W., where it turns to the N.W., and soon afterwards unites with the river Magog, flowing from Lake Memphramagog. It continues its course N.W. to its junction with the St. Lawrence, a distance of nearly 80 miles. The number of rapids and falls render the navigation of this river difficult and laborious; yet the trade upon it is considerable.

The Chaudière rises in the lake of Megantic, N.E. of the sources of the Connecticut, and flows about half of its course N., and the other half N.N.W. It is not navigable, owing to the rapids and falls following one another in quick succession. About four miles from its mouth are the celebrated Chaudière Falls, which are 130 feet high, the breadth of the river not being more than as many feet. Few falls can be compared with these for picturesque beauty. The course of the river amounts to more than 100 miles.

The country along the St. Lawrence, below the mouth of the Chaudière, rises from the banks of the river in irregular ridges, with generally a steep ascent, and attains a considerable elevation at the distance of 10, 15, and 20 miles from the river. It then forms a sort of table-land, which descends gently towards the river St. John. Though entirely covered with high hills and mountains, it is neither so bold nor so mountainous as the country on the opposite bank of the St. Lawrence. The high banks of the St Lawrence continue E. of Point Levy, but they soon begin to lower, and for some extent are of moderate elevation. At St. Anne they begin to rise in isolated cliffs of considerable height, and continue so to Kamouraska and St. Andrew's. Further down there is, close to the river, a steep ascent, varying between 150 and 200 feet; and this elevation is still considerably increased opposite Bic Island. From this part to Cape Roziere it maintains nearly the same height and character, except at a few places, where the rivers descend from the adjacent mountains. It is not improbable that the Spaniards, who are known to have visited the St. Lawrence before the English and French, on observing the high banks between which the St. Lawrence rolls its waters to the ocean, in their astonishment may have compared it with a chasm or ravine, and hence called it *Cañada*.

A very small part of this country is fit for cultivation, though in some of the valleys formed by the small rivers which descend to the St. Lawrence there is a good soil. In some tracts there are large forests, but the number of timber-trees is comparatively small, except in a few of the larger valleys. The population of this country is inconsiderable.

The peninsula of Gaspé, extending between the mouth of St. Lawrence and the Bay of Chaleurs, was formerly thought to be traversed in the middle by a range of mountains terminating at Cape Roziere; but it has been found to contain an elevated valley, skirted by two ranges of high hills, which extend at a short distance from the St. Lawrence and the Ristigouche river and the Bay of Chaleurs. In the valley there is a series of lakes, which send out rivers, that cut the ranges and fall into the St. Lawrence or the Bay of Chaleurs. The settlements in this country are few and situated along the Bay of Chaleurs, the banks of the St. Lawrence being nearly uninhabited. The inhabitants gain their livelihood by fishing and cultivating a few spots.

That portion of Lower Canada which does not lie within the basin of the St. Lawrence river, but is drained by the St. John and its tributaries, is in its lowest parts probably several hundred feet above the level of the sea. Its surface is very uneven, consisting of a continual succession of ridges, mountains and steep ascents, valleys, and low tracts [illegible] the rivers. The most elevated districts are contiguous to the [illegible] Maine, where a considerable number of high ridges and summits occur, but the absolute height of none of them has yet been determined. In the districts N. of St. John's river the hills are neither so high nor so steep as on the S., and the proportion of level land seems to be greater. The soil in the river bottoms and in the valleys is covered with trees of vigorous growth. This country, like every part of Canada, is watered by numerous streams, all of which flow into the St. John river.

The St. John river has three upper branches, which lie between 46° and 47° N. lat., and W. of 70° W. long., and all unite near that meridian. The St. John, or, as it is here called, the Walloostoock, runs for a great distance N.E. parallel to the St. Lawrence, and between 30 and 40 miles from it. By degrees it declines to the E., and is here joined by three large rivers, the Allagash running from the S., and the St. Francis and the Madawaska, both descending from the N. After its confluence with the Madawaska, it turns to the S E., and after having entered the British colony of New Brunswick, it runs for more than 80 miles within that province in a S. course. Having passed to the S. of 46°, it again turns to the E. and flows 80 miles in that direction, when it again turns S., and after a course of about 60 miles, falls into Fundy Bay with a wide estuary. Its course within New Brunswick is above 230 miles, and nearly as much belongs to Canada. Though descending from an elevated country, this river is more navigable than the others which drain Canada, the lower course of the St. Lawrence excepted. The upper part of its course, though not very deep, and in many parts rapid, is not broken by falls or rapids. Near the mouth of the Madawaska are the little falls, and at its entrance into New Brunswick the great falls, which are 75 feet in perpendicular height. Between them the navigation is easy and practicable for steam-boats. Below the great falls some rapids occur, but they do not appear to be so strong as to interrupt navigation. Vessels of from 50 to 100 tons ascend from the sea to Fredericton, about 100 miles from the mouth.

The whole of the country drained by the St. John is claimed by the American government according to the vague expressions in the treaty of 1783, by which the boundary-line between the United States and Great Britain was determined. The award given by the king of the Netherlands as mediator has not been adopted by either party. Meanwhile English settlements have been formed on both banks of the St. John up to its confluence with the Madawaska, and along the banks of the last-mentioned river, and of the lake of Temiscouata, which is the largest in this portion of Canada, extending in length 22 miles, and varying in breadth from ½ to 2½ miles. The road by which Canada communicates with New Brunswick and Nova Scotia by land, passes through these settlements.

The more inhabited parts of Canada lie between 42° and 48° N. lat., but the climate resembles that of the north of Germany and the centre of Russia. The greatest part of the country is covered with snow from two to four or even five months, and most of the rivers with ice for nearly the same time. The frost is sometimes so intense that the thermometer descends to 20° below zero of Fahrenheit, and even more. The heat in summer is very great; the thermometer rises every year to 100° and higher. The mean heat in July varies from 60° to 75°. The prevailing winds are from S.W., N.E., and N.W. The S.W. wind is the most frequent, but generally moderate and accompanied by clear skies; the N.E. brings continual rains in summer and snow in winter; the N.W. is dry, and attended with a great degree of cold. Fogs are almost unknown. Thunder-storms are frequent, and often cause great damage. The aurora borealis is more frequently seen than in Europe, and has a much greater degree of brilliancy. On the great lakes of Upper Canada water-spouts are sometimes formed.

The grains cultivated in Canada are wheat, barley, rye, Indian corn, oats, and buck-wheat. Nearly all the vegetables grown in England can be raised. Fruits do not grow equally well in all districts. At Quebec apples and pears are abundant, but the peach and the grape do not succeed. At Montreal grapes and peaches ripen; but on Lake Erie and [illegible] districts of Upper Canada, the peach, the nectarin[illegible] grape, with the other more common fruits, are [illegible] t perfection. H[illegible]p, flax, and tobacc[illegible] in many districts. [illegible] e extensive [illegible] cover by far the greatest part of the count a great quantity of timber. Sugar is [illegible] from the maple tree, and the spruce-fir is used for making spruce-beer.

The domestic animals are horses, cattle, sheep, and swine. The wild animals are deer, moose-deer, bears, wolves, wolveraines, foxes, wild cats, beavers, otters, &c. Fish is abundant in the numerous lakes; cod is taken in great quantities in the Bay of Chaleurs, and on some of the neighbouring banks. The herring and salmon fisheries are also considerable. The humming-bird appears in Canada; and the rattle-snake is not uncommon.

Canada is not rich in minerals, yet iron is found in many places, and worked in a few. There are also lead, copper, coals, salt, and brimstone; and also some traces of silver ore.

The inhabitants consist of aborigines and European settlers and their descendants. The aborigines are a very small part of the population; they belong to two nations, the Chippeways and Mohawks. The tribes of the Chippeways are dispersed over the countries bordering on Lakes Superior and Huron, and in Upper Canada. The most numerous of their tribes are the Algonquins, who inhabit the country between Lake Superior and the upper course of the Ottawa. The tribes of the Mohawks or Iroquois live in the countries along the St. Lawrence and between the lakes Ontario, Erie, and Huron. A few of them have settled in villages, and embraced Christianity. The rest are hunters, without fixed abodes. Their number is rapidly decreasing, especially in the neighbourhood of the European settlements.

The Europeans are partly English or their descendants, and partly of French origin. The French are chiefly the descendants of Frenchmen settled in Canada before the year 1759, and still form the majority of the population in Lower Canada, especially to the S. of St. Lawrence, where they altogether occupy some counties. On the N. side of the river the number of English is probably equal, if not greater. Upper Canada is inhabited by the English, Scotch, Irish, the number of French families being small, and [illegible] entirely limited to the country along the Detroit [illegible]. The Canadians of French origin have preserved their native language, but they generally speak it incorrectly, and with some intermixture of English words. They are Roman Catholics, and distinguished from the English in usages and manners. They have also preserved their own code of laws, which is that which was in use in the times of the antient French monarchy, and is called *coûtumes de Paris*.

Upper Canada comprehends the countries W. of the Ottawa, with the exception of a small tract at the confluence of the Ottawa with the St. Lawrence, which belongs to Lower Canada. It is divided into 11 districts, which, beginning from the W., follow one another as follows: Western, London, Niagara, Gore, Home, Newcastle, Midland, Johnstown, Ottawa, Bathurst, and Eastern. These districts are divided into 27 counties.

In the western districts, the towns having been only lately founded, are still small. The most important are Goderich, on the Huron lake and the mouth of Maitland river; Sandwich and Amherstburgh, on the river Détroit; London, on the Thames; and Sherbrooke, at the mouth of the Ouse. None of them probably have a population exceeding 1000 souls.

On the banks of the lake Ontario are the towns of Toronto or York, and Kingston. Toronto or York, the capital of Upper Canada, and the seat of its governor and parliament, has an excellent harbour called Toronto Bay. Its streets are straight, wide, and regular, and run at right angles. The houses are mostly of wood, except the public edifices. It is a thriving place, with more than 4000 inhabitants.

Kingston is very advantageously situated at the beginning of the Rideau canal and the Cataraqui river. Its harbour is well sheltered, and accessible to vessels not requiring more than three fathoms of water, with good anchorage close to the N.W. extremity of the town. It is the entrepôt of goods between Montreal and all the rapidly increasing settlements along the lakes to the W. In its neighbourhood, in Navy Bay, is the entrepôt of the British navy on lake Ontario. Its population, which in 1828 consisted of 3528 souls, now probably exceeds 5000 or even 6000.

On the Rideau canal is Perth, which in 1828 had only 400 inhabitants, but has rapidly increased of late. At the junction of the canal and the river Ottawa is Bytown on both sides of the canal, which is also a very thriving place.

Lower Canada comprehends the country to the E. and N. of the Ottawa, and on both sides of the St. Lawrence river. It is divided into four districts, Montreal, Three Rivers, Quebec, and Gaspé, which contain 40 counties.

In this province are Quebec, the capital, and Montreal, its largest commercial town. [QUEBEC and MONTREAL.] The other towns are small.

Three Rivers, situated on the N.W. side of the river St. Maurice, at its confluence with the St. Lawrence, had in 1825 only 2453 inhabitants. It has several pot and pearl-ash manufactories, two or three breweries, and an iron foundery, some iron-mines being situated in its neighbourhood. It has some commerce with British manufactured goods, and with the produce of the country, wheat, timber, and peltry.

Sorel, or William Henry, is built at the confluence of the river Chambly and the St. Lawrence, and is a place of some trade with the United States and with Montreal, though it is less important than might be expected from its advantageous situation.

(Bouchette; M'Gregor; Darby's *Geogr. of the United States*; Bigsby in London *Geo. Trans.*, &c.)

Canada was first discovered by John and Sebastian Cabot, in 1497. In 1525 it was visited by Verazani, a Florentine, who took possession of the country for the king of France. In 1535 Jacques Cartier, bearing a commission from the French king, explored the river St. Lawrence, which he so called from his having first entered it on St. Lawrence's day; but it was not until 1608 that the first permanent settlement, of which there is any record as having been made by Europeans on the continent of North America, was formed by the French under Champlain, on the spot now occupied by the city of Quebec. Settlements had been made about 1604, or the year following, under grants of Henry IV. of France, near the river St. Croix, and at Port Royal; but these settlements were broken up in 1614, owing to a successful attack upon them by Sir Samuel Argal. Quebec surrendered to the English under Kirk, in 1629, but was immediately restored to France, peace having been established with that country in April of that year. In 1663 the colony was constituted a royal government, and the governors were thenceforth appointed by the king. Canada continued a possession of France until 1759, in which year Quebec was taken by General Wolfe, and the province was ceded in full sovereignty to Great Britain by the treaty of Paris, in 1763. From that time until 1774 the affairs of Canada were regulated by the ordinances of the governor alone, but in that year, under an act of parliament called the Quebec Act, a legislative council of 23 members was appointed by the king. In 1791 the form of government was again altered; the executive power was continued in the governor appointed by the crown, and two legislative chambers were formed; the members of the council or upper chamber were appointed by the king for life, and the lower chamber or assembly was composed of persons elected every four years by the proprietors of the soil. The legislative council, which was originally composed of 15 members, now consists of nearly double that number; and the assembly has had its numbers augmented from time to time, owing to the increasing extent of the settlement, until at present the house contains 83 members.

Another body, to which the name of Executive Council has been given, and which is composed of 15 members appointed by the crown, acts as the privy council of the governor, and in that capacity exercises a direction over the internal affairs of the province.

From the year 1820 to the present time, dissensions have existed between the House of Assembly of Lower Canada and the executive government, which, with some intermissions, have been continually increasing in violence until, to use the words of Lord Glenelg, the colonial secretary of state, 'they have at length advanced to such a height as not only to invade the peace of society, but nearly to paralyse the activity of the executive government, threatening with the most fatal confusion a country exempt beyond the common lot of nations from the influence of the ordinary causes of social evil.' One of the main sources of this disunion is the claim of the House of Assembly, as representatives of the people of Lower Canada, to the right of appropriating to the public service, according to their own discretion, the whole of the revenues of the crown accruing within the province. This claim extends to the proceeds of all parliamentary and provincial statutes, whatever may have been the original conditions of these grants; to the funds drawn from the sale of timber and of the waste lands of the crown; to all fines and forfeitures, and to the income derived from the seignorial rights inherited by the king from his royal predecessors.

of Assembly claims further the right to

regulate the settlement and alienation of the within the colony. It complains of the constitution and mode of appointing the Legislative Council, a body which has hitherto possessed a co-ordinate right of legislation with representatives of the people, and the members of which have invariably been nominated by the executive government, which is said to have appointed to seats in the council a preponderating number of persons who are under the immediate control or influence of the government. Instead of a second legislative chamber thus constituted, and which is said to be, in effect, the executive power under a different name, the House of Assembly requires that the members of the legislative council should be chosen by the people, and declares 'that all remedial measures will be futile and unsatisfactory which should stop short of rendering the seats in the legislative council dependent on a popular election.' On this subject the assembly has proposed that public conventions, or, as they are termed, primary meetings, shall be held in every part of the province, in which meetings the proposed alteration shall be discussed by the people at large.

Complaint is also made of the composition of the executive council. It is maintained that 'the members of that body are incompetent to the proper performance of the judicial duty with which they are charged, and unfit to act as the confidential advisers of the governor in their more appropriate office of aiding in the execution of his administrative authority.' The evil consequences of this unfitness are said to have been 'the habit of appealing with inconvenient frequency to the secretary of state on many questions which might more advantageously have been disposed of in the province itself, thus causing much needless delay in the dispatch of public business, and bringing the supreme executive authority into needless collision with individuals and with the two houses of legislature.'

One source of disagreement in the colony arises from the fact of the population being divided into two distinct races. By far the most numerous of these races consists of the descendants of the French colonists, who, though they have now lived for more than three quarters of a century under the British government, still consider themselves as having interests different from those of the more recent English settlers, and it is probable that this feeling may have been fostered by the difference in the tenures by which their property is held; the estates or seigneuries of the French Canadians being fiefs, while the townships of the English settlers are granted in free socage. Under the principle adopted in 1792 for regulating the return of members to the provincial parliament, the numerical superiority of the French Canadians has insured them a considerable majority in the House of Assembly, while, on the other hand, the legislative council being nominated by the government, a majority of its members has consisted of persons attached to the English party. The consequence has been that the two chambers have been frequently in a state of opposition to each other, and various important bills which from time to time have been passed in the one house have been negatived in the other. It is with a view to remedy this evil that the House of Assembly insists so firmly upon an alteration in the constitution of the Legislative Council. The Canadians further urge that the province contains no aristocracy, the members of which by their great possessions and influence command respect and deference from other classes; and that this state of society being similar to that existing in the United States, the constitution of the legislative council should be assimilated to that of the American senate.

Among other causes of dissatisfaction are the assumption on the part of the crown of the right to administer certain estates formerly held by the order of Jesuits, and the interposition of the imperial parliament in the establishment of the North American Land Company, which is felt as 'an unnecessary interference with the authority of the local legislature over the internal affairs of the province.'

For the investigation of those various grievances, a select committee of the House of Commons was appointed in 1828. Having examined various persons connected with the colony, this committee presented a report, in which various measures of a conciliatory nature were recommended; and it appears from the report of another committee, appointed in 1834 to inquire how far these recommen had been carried into effect, that considerable efforts that time been made for that purpose by the home ment, through the governor of the province. having failed, a board of commissioners, consist of Gosford, who was at the same time appointed governor, and o other members, were sent to Canada, in order to inquire into the alleged grievances, with a view to the redress of such as should appear well founded and to a friendly adjustment of the differences. The instructions given by government to the commissioners have been printed by order of parliament, from which it appears that, as to all questions purely financial, the home government is disposed to concede all the claims of the House of Assembly, provided the Assembly will pass a law making permanent provision for the payment of the judges, and for providing a civil list for a limited number of years, so that the colonial functionaries may not be continually dependent upon the pleasure of the provincial parliament. With respect to the territorial revenue and the management of the uncleared territory, it is stated in the instructions given to the commissioners as the decided opinion of the secretary of state, that 'in the distribution of the different powers of the state, the office of settling and alienating the uncleared territory properly belongs to the executive government, and that his Majesty's confidential advisers regard as conclusive and unanswerable the objections which are made to confiding the management of the uncleared territory to either or to both of the houses of general assembly, or to persons appointed by them and subject to their control.' It is on the other hand admitted that it is not necessarily incompatible with the intelligent, faithful, and punctual execution of the duty of managing the crown lands that the revenue derived from them should be placed at the disposal of the legislature. With reference to the constitution of the legislative council, the commissioners are instructed to ascertain how far that body has answered the original objects of its institution, and to consider of what amendments it may be susceptible, and a promise is given that upon receiving the report of the commissioners, 'his Majesty will take into his most serious consideration the question whether there are any amendments in the law upon this subject, which it would be fit to propose for the consideration of the imperial legislature.'

The commissioners of inquiry were appointed in July, 1835, and proceeded soon after to Canada. It is understood that they have hitherto met with difficulties in the adjustment of the differences, but as no formal report has yet been made by them to the government, it would be premature at this time (June, 1836) to offer any opinion as to the ultimate result of their mission.

The misunderstandings between the colonists of Upper Canada and the home government are of recent origin. In the autumn of 1834, after a general election of the house of assembly, among the earliest measures adopted by the new house was the appointment of a committee of grievances, by which body 'a report was made impugning the administration of affairs in every department of the public service, and calling for remedial measures of such magnitude and variety as apparently to embrace every conceivable topic of complaint.' This report was adopted and published by the house, and transmitted through the lieutenant-governor of the province to the king.

The principal grievances of which complaint is made in this report are:—1. The almost unlimited extent of the patronage of the crown, or of the colonial minister and his advisers in the colony, and the abuse of that patronage. 2. The mode of conducting the business of the provincial post-office. 3. The excessive amount of salaries and fees enjoyed by public officers. 4. The amount of the pension list. 5. The provision made for ecclesiastical establishments, and for the maintenance of the teachers of religion of various denominations. Under this head the house of assembly complains of the conduct of the government in attempting to uphold particular religious sects by money grants, and refers to declarations made by preceding provincial parliaments that 'the assembly recognizes no particular denomination as established in Upper Canada, with exclusive claims, powers, and privileges.' 6. The regulations and practice pursued in the land-granting department. 7. The great expense of the collegiate institutions of the province, and particularly of the Upper Canada college, from which it is alleged 'the province in general derives so little advantage, that it might be dispensed with.' 8. The unsatisfactory mode expending the money granted in aid of emigration from urope, and the impossibility of a proper examin respecting the same on the part of the cient system of auditing the thholding of public accounts 11. A failure on the part of the lieutenant-governor to show respect to the wishes of the house of assembly. 12. Neglect on the part of the local government to carry into effect certain recommendations of the secretary of state, the adoption of which would be satisfactory to the colonists. Among these recommendations are 'an amendment of the election laws, the non-interference of government officers at elections—the disclosure to the house of assembly of the receipt and expenditure of the crown revenue—the exclusion of ministers of religion from the legislative and executive councils—the reducing the costs of elections, the judicial independence, and the limitation of the number of public officers who may sit in the assembly. 13. The partiality towards persons of a peculiar bias in politics shown by the colonial government in selecting justices of the peace. 14. The virtual irresponsibility of the executive government of Upper Canada, and the consequent impossibility of obtaining a good and faithful administration of public affairs. 15. The unsatisfactory constitution of the body of legislative councillors; and 16. The absence of control by the assembly over the territorial and casual revenues of the crown.

Since the transmission of this report from the colony a change has been made in the appointment of the lieutenant-governor. Sir John Colborne has returned to Europe, and has been succeeded in his office by Sir Francis Head, who has carried with him instructions of a conciliatory nature, a compliance with which appears calculated to remove or redress the greater part of the sixteen heads of grievance of which complaint was made by the house of assembly. It will be seen that as regards many of these grievances they are not in their nature very difficult of arrangement, and in the published instructions furnished to Sir Francis Head, they appear to be, for the most part, met in a spirit of liberal concession. As regards the objection taken against the number of government officers in the colony, it is urged that 'in Upper Canada, as in other new countries, the number of public employments must be larger in proportion than in older and more densely-peopled states, since the general machinery of government must be the same in a scanty as in a large and redundant population.' And it is further stated that in a new country 'there will, besides, be some establishments for which in settled states no counterpart can be found—such, for example, as relate to the allocation, surveying, and granting of wild lands.'

It is also objected by the home government that officers who should be appointed through a popular election would be virtually exempt from responsibility, and that from such a mode of appointment would result a want of unity and subordination which are necessary for the satisfactory carrying on of the government. Coupled with the expression of these opinions are instructions to enter into a diligent review of the offices in the appointment of the crown and local government with a view to their reduction and to an inquiry how far it may be safe and wise to transfer the patronage to other hands.

As to the 5th head of grievance—that relating to the provision made for ecclesiastical establishments—it appears to be the present policy of the home government to await the issue of this conflict of opinion rather than to interpose for its settlement the authority of the imperial parliament, a course to which they are urged by the legislative council. 'We must not,' they say, 'have recourse to an extreme remedy, merely to avoid the embarrassment which is the present though temporary result of our own deliberate legislation.'

The subject of the Upper Canada or King's College is also a cause of disagreement, as to which the mediation of the king is offered for reconciling the conflicting opinions of the council and assembly, being made to modify the conditions of the charter, a proposal so as to suit the wishes of both houses.

The 8th, 9th, and 10th heads of complaint are met in the instructions in a way that must be satisfactory to the colonists. The 11th is of a personal nature, and has now ceased. As regards the 12th, the new lieutenant-governor is expressly directed to adhere, 'without reserve or qualification, to all the instructions issued by Lord Ripon,' when colonial secretary of state. The attention of Sir Francis Head is called to the 13th grievance with a view to his avoiding any such abuse in the administration of his government.

The other causes of complaint urged by the house of assembly, with the exception of the 15th and 16th, appear to be comparatively unimportant, or to depend for their remedy upon the satisfactory arrangement of some one or other of the heads that have been more particularly noticed.

In commenting on the 15th and 16th subjects comprehended in the list of grievances, Lord Glenelg, the secretary of state, by whom the instructions to the lieutenant-governor are drawn up, says: 'On these subjects I am, to a considerable extent, relieved from the necessity of any particular investigation, because claims precisely identical have been preferred by the assembly of Lower Canada, and because, in the instructions to the commissioners of inquiry who have visited that province, I have already had occasion to state the views which have received his majesty's deliberate sanction. The principles of government in the two sister provinces must, I am well aware, be in every material respect the same; I shall therefore annex for your information so instructions to the Earl of Gosford and his colleagues as applies to these topics.'

The promulgation in the province of the instructions given to Sir Francis Head, and his proceedings in conformity with the same, do not appear hitherto to have done much (if indeed they have done anything) towards bringing about a settled state of affairs, and renewed remonstrances on the part of the assembly have very recently (1836) been presented to the House of Commons.

Lower Canada (Statistics of).

The population of the province of Lower Canada, according to the census of 1830, amounted to 511,917 souls. A previous enumeration, made in 1825, gave 423,630, showing an increase from natural causes and from immigration, of 83,287, which is 19⅝ per cent., or rather more than 3¼ per cent. annually. There is reason to believe that the population as given in the returns of 1825 was below its true amount, the heads of families having understated the numbers of their household, in consequence of the doubts entertained as to the views of the colonial legislature in instituting the census. The enumeration of 1831 has been [illegible] with great minuteness of details, but several discrepancies are observable in the tables, and we cannot therefore place entire confidence in their accuracy. The number of inhabited houses in the province is stated to have been then 82,437; the number being built 1458, and vacant 1542; together 85,437. The number of proprietors of real property is given at 57,891; and the extent of land occupied by them is 3,981,793 statute acres. The number of persons living in 1831 who were deaf and dumb is stated to have been 408; the blind 334; and the insane 924. The great bulk of the inhabitants profess the Roman Catholic creed; the number of these in 1831 was 403 472; the persons in connexion with the Church of England were 34,620; those belonging to the Church of Scotland amounted to 15,069; there were only 107 Jews; the remainder of the population were Methodists, Baptists, Presbyterians not in connexion with the Church of Scotland, and other sects.

The number of families employed in agriculture was 50,824, employing among them as farm-servants only 7602 persons. There were in the same year (1831) 2503 families engaged in commercial pursuits, and 1282 persons subsisting on alms. The following additional particulars given in the returns made to the House of Assembly of the province in 1831, throw some further light upon the habits and occupations of the people:—Number of taverns, 1035; stores where spirituous liquors are sold, 857; grist mills, 395; saw mills, 737; oil mills, 14; fulling mills, 97; carding mills, 90; iron-works, 103; trip-hammers, 18; distilleries, 70; pot and pearl-ash manufactories, 489; manufactories of any other sort, containing machinery moved by wind, water, or animal power, 64.

The number of emigrants who arrived at Quebec in each of the seven years from 1829 to 1835 inclusive is shown in the following table.

Where from	1829.	1830.	1831.	1832.	1833.	1834.	1835.
England and Wales	3,565	6,799	10,343	17,481	5,198	6,799	3,067
Ireland	9,614	18,300	34,133	28,204	12,013	19,206	
Scotland	2,643	2,450	5,354	5,500	4,[illegible]	4,591	2,127
Hamburg and Gibraltar				15			
Nova Scotia, Newfoundland, West Indies, &c	123	451	424	546	345	339	225
	15,945	28,000	50,254	51,746	21,752	30,935	12,527
Total in 7 years.				211,159			

The majority of the emigrants passed to the upper two years have not been given; but in 1834 and 1[illegible] the persons so remaining in the province were 4090 and 2[illegible] respectively.

The 'movement' of the population in the years 1833 and 1834 was as follows:—

	1833.	1834.	Proportion to Population.[*] 1833.	1834.
Births	25,247	26,114	1 in 22½	1 in 19½
Marriages	4,781	4,598	1 „ 107	1 „ 111
Deaths	10,793	15,714	1 „ 47	1 „ 32½

The proportion of births is much greater than that which occurs in old and well-peopled countries, and, as a necessary accompaniment, the proportionate number of deaths is greater also; the principal mortality occurring at the earliest periods of life.

The province of Lower Canada is divided into three chief districts,—Quebec, Montreal, and Three Rivers; and two inferior districts—Gaspé and St. Francis. These districts are sub-divided as under:—

	Counties.	Seigniories.	Fiefs.	Townships.
Quebec district	13	79	12	38
Montreal „	19	70	6	59
Three Rivers „	6	25	9	53
Gaspé „	2	1	6	10
	40	175	33	160

The inferior district of St. Francis contains 39 townships, which are included above with the townships of Montreal and Three Rivers.

The following table shows the highest, lowest, and mean temperature, and the state of the weather, observed in each month of the year.—

MONTH.	Temperature by Fahrenheit's Thermometer. Maximum.	Minimum.	Mean.	State of the Weather. Clear.	Rain or Snow.	Cloudy.
				Days.	Days.	Days.
January	33	23	11·14	23	4	4
February	40	29	10·69	21	3	4
March	47	26	12·13	25	3	3
April	81	9	48·91	25	3	2
May	92	30	67·84	23	4	4
June	95	55	76·34	26	2	2
July	103	62	82·23	26	3	3
August	100	58	74·7	16	12	3
September	90	30	59·16	18	8	4
October	55	9	32·24	16	5	10
November	40	13	17·44	14	7	9
December	43	21	11·94	23	2	6
				256	56	53
					21 Snow. 35 Rain.	

In 1831, the number of cattle throughout the provinces was 389,706; the number of horses, 116,686; of sheep, 543,343; and of hogs, 295,137. The quantity of agricultural produce raised during that year was as follows, stated in bushels:—Wheat, 3,208,075; peas, 984,198; oats, 3,153,597; barley, 393,382; rye, 235,010; Indian corn, 340,073; potatoes, 6,139,221; buckwheat, 105,811.

The number of domestic looms is estimated in the government returns at 13,400, and their annual produce is assumed to be—

Coarse cloth . .	about 1,400,000 yards.
Ditto flannel . .	981,000 „
Linen . . .	1,366,726 „

There is one manufactory for making cloth which employs twenty persons.

The produce of the fisheries was valued in the three years 1832 to 1834 as under:—

	1832.	1833.	1834
Codfish . . .	£28,231	£27,536	£46,337
Salmon . .	2,488	723	2,397
Herrings .	1,032	318	489
Mackerel .	212	91	382
Alewives .	290	325	...
Fish oil . .	1,038	2,290	1,560
	33,291	31,283	51,165

There are 78 free schools established in different parishes throughout the province, and 3578 children were receiving instruction in 1832. The expense of these schools, to the provincial government, in that year was 1895*l.* [illegible] Two grammar schools, one at Quebec, the other at Montreal, receive annually 344*l.* each from the public funds. Twenty free scholars are admitted into each of these schools. There are also 1062 schools established under an act of the provincial legislature, and in these schools 48,3[illegible] scholars of both sexes were receiving instruction in 18[illegible], being about one-half the number of persons in the province between the ages of five and fourteen years. Several colleges in connexion with the Roman Catholic Church exist in different parts of the province, as well as a considerable number of private schools, in which the higher branches of education are taught, but not any statement of their number or situation has been given.

The ecclesiastical establishment of Lower Canada consists of the bishop of Quebec—who has spiritual jurisdiction in the Upper Province also—an archdeacon of Quebec, a rector of every parish, and a minister to each 'mission.' There are at present only ten districts within the province that have been formed into parishes, included in these are Quebec, Montreal, Three Rivers, and St. John's. The remaining districts are called missions, and the stipends of the clergy are paid through the Society for Propagating the Gospel in Foreign Parts, to which an annual parliamentary grant is made for the purpose. There is also a Roman Catholic bishop of Quebec, whose salary of 1000*l.* per annum is paid out of the rents of some public property.

In every part of the province there are places of public worship for persons dissenting from the Church of England. In the seigniories, the great mass of the inhabitants are Roman Catholics, while in the townships a large number are Protestant dissenters, or in communion with the Church of Scotland.

The number of men embodied in the militia for the defence of the province, in 1833, was as follows:—

DISTRICTS.	Number of Battalions	Number of Companies	Number of Militiamen 18 to 59 years of Age.	Grand Total of Militia.	Number of Muskets.
Quebec .	26	297	29,786	29,786	2,836
Three Rivers	8	87	8,709	8,709	1,350
Montreal .	46	559	47,377	47,377	3,7[illegible]8
St Francis .	5	71	6,215	6,215	130
Gaspe .	3	26	2,250	2,250	
Total .	88	1,040	94,377	94,337	8,001

The external trade of the province is carried on at the ports of Quebec, Montreal, St. John's, Coteau du Lac, and Stanstead. The number and tonnage of the ships, &c., that entered these ports in the year 1834 was as under:—

From

	Great Britain. Vessels.	Tonnage.	British Colonies. Vessels.		United States.[*] Vessels.		For. Countries.	Tons.
At Quebec .	858	256,942	196	27,974	20	6,760		4874
,, Montreal	73	18,576	13	1,298	..	..		
,, St. John's					396	69,128		
					Carriages, 754	37		
Coteau du Lac			Schooners, 73	4,890	58	3,790		
			Barges, 64	27,272	217	7,465		
			Rafts, 111	65,600	90	72,000		
			Winter Carriages, 1817					
Stanstead					Carriages, 398	199		
	931	275,518	2974	127,034	1933	139,709	20	5249

The customs' duty collected in 1834 amounted to 84,184*l.* 10*s.* 11*d.*, of which sum 56,011*l.* 8*s.* 7*d.* was allotted to Upper Canada, the external trade of that province being carried on through the ports of Quebec and Montreal.

From the United Kingdom Canada receives coals, metals, cordage, East India produce, and the various kinds of

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[*] Calculated upon the census of 1831.

[illegible] The annual im[illegible]rts of cotton goods are to the amount of [illegible] and [illegible] ards of linen, 50,000*l.*; and of woollens, 230,000*l.* [illegible] the British West India colonies, sugar, molasses, coffe[illegible] [illegible]d hard woods [illegible] ceived. From the United Sta[illegible] [illegible]anada is supplied [illegible] beef and pork, biscuit, rice, and tobacco. The total value of the imports in 1833 was 1,665,144*l.* The exports of Canada are:—To the United Kingdom, pot and pearl ashes, wheat and flour, and timber in its various forms. To the West Indies, beef and pork, beer, grain, and flour. To the United States the export trade, of which any record appears at the custom-houses, is very trifling. The total exports of the colony in 1833 amounted to 965,026*l.*

UPPER CANADA. The population of the counties of the upper province in 1834 was as follows:—Ottawa, 6335; Eastern, 25,105; Johnstown, 28,061; Bathurst, 22,079; Midland, 44,332; Newcastle, 27,404; Home, 55,540 (including Toronto, 9252); Niagara, 27,347; Gore, 34,618; London, 38,330; Western, 12,752. Total, 321,903.

The following table exhibits the area in square miles of each county, the number of acres cultivated and uncultivated, and the number of stock in 1833:—

Name of the District.	[illegible]	Number of cultivated [and] uncultivated in each dist.		Stock, number [of]		Nature of the pro[duce] and price there[of]
		[illegible]	No. of acres uncultivated.	[illegible]	Horned Cattle.	
Ottawa	1,118	13	103,920¼	413	[illegible],86[illegible]	The price [illegible] (the principal article of export from the province) varied in the [illegible]eral districts from 9*d* to 5*s.* per bushel, depending principally on the facility of transportation
E[illegible]	1,825	68,560¾	350,501¼	4,477	12,526	
Johnstown	1,650	78,042	320,306¼	3,383	14,911	
Bathurst	1,700	52,450	344,425	1,283	10,889	
Midland	3,492	165,[illegible]¼	438,769	7,453	24,894	
Newcastle	3,02[illegible]	98,127¼	400,873½	2,568	13,786	
Home	3,672	141,393	619,866	5,274	24,990	
Niagara	1,986	111,721¼	329,685¾	4,887	17,211	Tobacco is produce[d] in the western distri[ct] of an excellent quality and for several yea[rs] back has been cult[i]vated for export.
Gore	[illegible]	137,579	488,398	4,431	21,295	
London	3,204	[illegible],230	591,291	3,767	21,815	
Western	1,929	[illegible]59	201,619¼	2,168	7,434	
Total	24,0[illegible]	988,957¼	4,205,256	40,[illegible]4	172,674	

The number of men embodied in the militia in 1834 was 39,499, including commissioned and non-commissioned officers; the number of regiments was 63, of troops of cavalry 18, and companies of artillery five.

There are in Upper Canada 475 grist-mills and 670 saw-mills. Whisky distilleries are numerous, but the exact number has not been ascertained. The domestic manufacture of woollen goods is commonly carried on. There are two paper-mills, one in Home, the other in Gore district. Several iron-works are maintained in Western, London, and Midland districts. Extensive beds of gypsum are worked on the banks of Grand River in Gore district.

A salary of 100*l.* per annum is assigned by the legislature for a classical master in each district. A school is consequently maintained in each for teaching the common branches of knowledge. A further sum of 250*l.* is appropriated for the maintenance of common schools in each district. These common schools are very numerous, and at least 18,000 children, male and female, are taught in them. The funds first mentioned as having been provided by th[e] Assembly for this purpose having been found wholly inadequate to the object, the grant was enlarged in 1832 to each district, according to its population, and the sum voted amounted to 8550*l.*

The Upper Canada College, situated at Toronto (formerly York), the capital of the province, has a royal charter of incorporation, and is established for teaching classical, mathematical, and the more general branches of knowledge. The college is under the control of the lieutenant-governor of the province as visitor, and has an establishment consisting of a principal, a classical and a mathematical master, as well as masters for teaching French, writing, arithmetic, and drawing. No tests or subscriptions of articles are required from the pupils, but it has been objected that those to whom its management has been intrusted have contrived by their regulations to confine the advantages of the institution too exclusively to the members of the Church of England; a course of proceeding which has formed one ground of complaint against the colonial government on the part of the House of Assembly.

The number of churches and chapels in the province in 1834 was as under:—

Districts.	Episcopal Churches.	Presbyterians of Church of Scotland.	Presbyterians not of Church of Scotland.	Roman Catholics.
Eastern	4	4	1	3
Johnstown	4	1	2	2
Bathurst	5	6	2	3
Midland	7	2	2	2
Newcastle	4	1	0	2
Home	4	3	1	6
Gore	4	5	1	2
Niagara	5	1	1	2
London	4	1	1	2
Western	4	1	0	3
		25	11	27

The ecclesiastical establishment consists (in addition to the bishop of Quebec) of the archdeacons of York and Kingston, and of resident ministers to each parish: there is also a Roman Catholic bishop under the title of bish[op of] Regiopolis: his salary of 500*l.* per annum, and about [illegible] for the support of priests of that persuasion, are paid by government. The salaries of ministers of the church of Scotland are paid partly by government and partly by the several congregations. Other dissenting ministers depend upon the subscriptions of their congregations.

A joint-stock company, under the title of the Canada Company, was incorporated in 1826 by an act of the imperial parliament, and by a royal charter; to which company his Majesty was empowered to grant or sell certain portions of the lands reserved for the crown and clergy in the province of Upper Canada. This company, having obtained subscriptions to its capital amounting to one million sterling, purchased from the government upwards of 2,300,000 acres of land; 1,300,000 acres of this purchase consisted of tracts of various sizes from 200 to 40,000 acres each, in various townships; the remaining million of acres, composing a section of territory on the shores of Lake Huron, and known as the Huron Tract, was assigned in lieu of the moiety of the clergy reserves scattered through the different townships of the province. For this territory the company covenanted to pay in sixteen annual instalments the sum of 295,000*l.*, or about 2*s.* 6*d.* per acre: the last of these annual payments is to be made in the year 1842. By its contract with the government, the company is authorised to expend the sum of 45,000*l.*, part of the purchase-money, under the sanction of the provincial government, or of the secretary of state, in the construction of roads and other works of public utility within the Huron Tract. This tract is situated on the E. and S.E. shores of Lake Huron, along which it extends 60 miles, being about 40 miles at its nearest point from the head of Lake Ontario, and 30 miles from Lake Erie.

By the establishment of this company a considerable impulsion has been given to emigration from this country, and to the settlement of many parts of the province. Two thriving towns, Guelph and Goderich, have been founded: the first of these is in the county of Halton, Gore district, upon the river Speed, a branch of the Ouse or Grand River, and communicating through it with Lake Erie. Goderich is on the borders or Lake Huron, at the mouth of the river Maitland, which forms a commodious harbour. The village of Galt, also in Halton county, and 17 miles from Guelph, is another settlement of the Canada Company.

The British American Land Company, the incorporation of which by the imperial parliament forms a ground of complaint on the part of the Assembly of Lower Canada, has purchased from the government nearly one million of acres of land, situated in what are called the Eastern Townships of Lower Canada, and forming part of the counties of Shefford, Stanstead, and Sherbrook. Part of the lands thus purchased, amounting to 300,000 acres, consist of the crown and clergy reserves, and are for the most part in detached lots or farms of 200 acres each. Another part consists of the St. Francis territory in the county of Sherbrook, and comprises about 800,000 acres in one large tract or block of land. Part of the purchase money (60,000*l.*) stipulated to be paid by the company, is to be expended in public works and improvements, such as roads, bridges, canals, school-houses, and churches within the districts.

CANADA GOOSE. [Goose.]

CANADIAN SEAS, a term that has sometimes not inaptly been used to designate [illegible] fresh-water lakes, Superior, Huron, &c., which [illegible] the basin of the St. Lawrence. As the form[illegible] the basin of this large river mainly belong[illegible] is most convenient to include the description of the Canadian Seas and the St. Lawrence under the general description of CANADA.

CANADE. [VAISESHICA.]

CANAL, an artificial channel filled with water, which in modern times is usually formed in order to make a cheap and easy means for the conveyance of goods. Canals have sometimes been made for the purposes of irrigation and of supplying towns with water. The New River, by which London is in great part provided with water from Hertfordshire, is a canal. The canals by which antient Egypt was intersected were used both for the purposes of navigation and irrigation. Canals are known to have existed in China before the Christian æra; but since the acquaintance of Europeans with that country, no improvement has been made in their construction.

The word canal comes from the Latin 'canalis,' which seems to signify properly any tube adapted to convey a liquid: afterwards it seems to have been used pretty nearly in the sense of our word 'canal,' (Suetonius, *Claudius*, 20) though the proper Latin word for canal is 'fossa.' Canalis is in fact an adjective form, and is evidently derived from *canna*, a reed or pipe. The first canal made in Europe, so far as we know, was that cut by Xerxes across the low isthmus of Athos. [ATHOS.] Canals were made by the Romans in Italy and in the Low Countries about the outlets of the Rhine; and we have good reason for believing that they also made canals in Britain. But canal-making in modern Europe was first practised by the inhabitants of North Italy and Holland. Works of this kind, which are still much admired by engineers, were executed in Lombardy between the 11th and 13th centuries; they were principally intended for irrigation: the canal from Milan to the Tesino was made navigable in 1271. The construction of canals was begun in the Netherlands in the 12th century, when Flanders became the commercial entrepôt of Europe. Holland is intersected with canals, which for number have been compared to the public roads in this country.

The origin of English canals dates from the year 1755, when an Act of Parliament was passed for constructing one 1[illegible] miles long from the mouth of Sankey-brook, in the river Mersey, to Gerrard's Bridge and St. Helens. Before this work was finished, the Duke of Bridgewater commenced his canal between Worsley and Manchester. [BRIDGEWATER, DUKE OF, and BRINDLEY.] The aggregate length of the navigable canals of England alone now exceeds 2200 miles. In addition to making canals, such of the rivers as are capable of it have been made navigable, so that there is no spot in England south of Durham which is more than 15 miles distant from water-communication; and in those districts which are the principal seats of manufactures, that distance is even smaller; while every considerable town of those manufacturing districts has this means of cheap and easy conveyance for receiving the raw materials which it employs, and for distributing to other parts of the country and to the sea-ports the finished products of its industry. A few years ago, when the introduction of iron railroads became a favourite speculation, it was supposed that canals would no longer be wanted; that not only would a stop be put to the construction of any new canal, but that many at present in use would be drained and converted into lines for railroads; but independent of other considerations, no proper estimate was formed of the expense of maintaining a railroad in perfect repair, and experience has hitherto shown that even where the latter mode of transport has been most successfully introduced, it has not injuriously interfered with the profits of canals. At the present time (1836), when so great progress has been made towards the completion of a railway between London and Birmingham, a project has been brought forward, and is supported by men of great commercial weight and influence, for the construction of a new canal, commencing at the Stratford-on-Avon Canal in Warwickshire and ending at the Regent's Canal, London, for the conveyance of goods, th[illegible]ue of which is small compared with their weight, an[illegible]ich will not therefore bear the higher toll required for maintaining the railway. For goods of this description, which form a very large portion of the traffic carried on throughout the [illegible] the expedition attained by the railway is not required; as from present [illegible]nce it appears likely that the greater cost of constructing a[illegible] maintaining railroads will in general make it necessary [illegible] impose a higher toll upon goods conveyed by them than is sufficient to pay the proprietors of canals, there is little reason to suppose that existing canals will be abandoned.

In a level country like Holland, the cutting of a canal is comparatively easy; the work may generally be carried forward in a straight line, and none of the costly expedients of deep cutting, tunnelling, or lock-making, are necessary. But even where the surface of a country is level, difficulties may be presented by the nature of the soil through which the cuttings are made, and by the insufficient supply of water. Where the soil is composed of sand, gravel, l[illegible] rock, or other matter, through which water will perco[illegible] it is necessary to line the floor and the sides of the c[illegible] with some substance of a different quality. This process, which is called *puddling*, is thus performed: a mixture is made, generally of lightish loam and coarse sand or fine gravel; this mixture must be reduced to a semifluid state, and well worked with a spade until it is made homogeneous, in which state it is applied in three or more strata to the depth or thickness of about three feet. The first stratum, about ten or twelve inches thick, is first allowed to set, when another course of about nine inches is applied, and so on until the requisite thickness has been attained, care being taken so to work the puddling stuff at each time as to unite it with the stratum immediately below. Over the top course of puddling stuff, a layer, one and a half or two feet thick, of common soil must be laid. Strong clay, which, under certain circumstances, is retentive of water, will not answer for puddling, because of its tendency to shrink and crack; neither will it answer to employ as puddling stuff any soil which contains roots or other organic matter, which would decay and leave cavities. Attention to the proper performance of this work is necessary to insure the constant efficiency of the canal, and to prevent damage to the land through which it passes, by reason of the continued escape of water. As a further security against leakage through the sides of the canal, it is usual to cut mud ditches in each of them, to which the name of puddle ditches or puddle gutters is given. These ditches are usually about three feet wide; they must be carried down perpendicularly below the bottom of the canal, and must be a few inches higher than the top water-line. They are filled gradually with puddling stuff, and, when properly made, form an effectual barrier to the passage of water through the banks.

The sides of the canal, where they are above the level of the adjacent country, are formed out of the soil thrown out of the bed of the canal; and if this should be of a light and porous nature, it is necessary not only to render it impervious to water, but also to adopt means for giving it stability. This is best effected by covering it externally with turf.

Another important matter in canal-making is the insuring of a sufficient supply of water at all seasons, in order to make up for waste by evaporation and otherwise.

The difficulty in providing a sufficient su[illegible] will be partly understood when it is considered that [illegible] ply must be effectually secured at the highest le[illegible] canal as well as through the other parts of its [illegible] this purpose it is necessary, when marking out [illegible] ascertain the situation and capability of every spr[illegible] rivulet within the requisite distance, as well as to [illegible] rangements with the owners or occupiers of the sam[illegible] mission to appropriate their waters to the purpose of [illegible] as feeders, or for the filling of reservoirs. It will f[illegible] happen that such reservoirs must be constructed at a hi[illegible] level than the streams or springs from which they must be supplied; in which case it will be necessary to erect steam-engines to throw up the water to the summit level of the canal. Similar reservoirs will be necessary at different points below that level, in order to supply the unavoidable waste of water at the locks. Such reservoirs are also necessary, because the proprietors of a canal are always required to compensate the owners of mills, placed lower down the streams, for the water which is taken nearer their sources for feeding the canal. The size of a reservoir must of course be regulated by the quantity of water which, from the nature of the adjacent country, may be expected to drain into it. In its construction it is necessary, when the soil is porous, to adopt the same means for making it water-tight as have already been described in speaking of the canal. Seasons will of course occur when reservoirs, which are in general of ample dimensions, will be too smal[illegible] contain all the water that drains into them, and provisi[illegible] must accordingly [illegible] made for letting off the surplus in [illegible] a manner as will prevent injury to any land.

It is also necessary, where the nature of the soil req[illegible] it, to puddle the channels of the various springs and bro[illegible] which are to act as feeders to the canal. In order to avoid great inequality of surface, or a circuitous line through cultivated lands, it is sometimes necessary to convey the water through bricked culverts. In many cases cast-iron pipes have been found cheapest, as for instance, where the feeders must be carried across valleys or other streams.

In cases, which are by no means uncommon, where the [illegible] must be carried across a stream or a deep valley, [illegible]t bridge is indispensable. The late Mr. Telford [illegible] first engineer who constructed an aqueduct of cast-[illegible] which forms part of the Shrewsbury Canal where it crosses the valley of the Tern at Long Mill, and is 186 feet in length. With the exception of the nuts and screws used for holding together the plates at their flanches, and which are made of wrought-iron, the material of which this aqueduct is constructed is wholly cast-iron. It was ap[illegible]ended that the great alternations of heat and cold to w[illegible]h the iron would be exposed, would have caused such a d[illegible] of expansion and contraction as would have torn off the flanches and broken the plates; but this fear has proved groundless, and the advantages of iron over masonry for this purpose are in many respects so great, that the example of the Long Aqueduct has since been frequently followed. A stupendous work of this kind was executed about twenty [illegible] W. of Chester, where the Ellesmere and Chester Canal is carried over the Dee at Pont-y-Cysylte. This [illegible] at an elevation of 125 feet above the bed of the [illegible] nineteen pairs of stone-pillars, fifty-two feet apart. [illegible] which forms the canal is 988 feet long, twenty [illegible] and six feet deep, and is composed altogether of [illegible]tes."

In the construction of a canal, recourse is had to tunnelling, or the formation of underground channels, where the elevation of the surface would make a long circuit necessary, or where it would be difficult to convey a sufficient supply of water to the level of the canal. Some of these cuttings are of great length. The tunnel at Blisworth, on the Grand [illegible] Canal, is 3080 yards in length. The underground [illegible] the Duke of Bridgewater's Canal are said to be [illegible] eighteen miles long, and to have cost 170,000*l.* [illegible] tunnel, in the Huddersfield Canal, is 5451 [illegible] The tunnel at Sapperton, in the Thames and [illegible] is two miles and three-eighths in length, and [illegible] the highest point of the hill through which [illegible] made. In the Thames and Medway Canal, [illegible]send and Rochester, a tunnel two miles and one furlong in length is cut through the chalk; and one of [illegible] of the Leominster Canal at Pensax is 3850 yards [illegible] Besides these, there are many similar cuttings of smaller dimensions in different parts of the kingdom.

The invention of locks, as a means of carrying canals [illegible] uneven country, is said to be modern, and yet [illegible] controversy has arisen in regard to the country in [illegible] first adopted. Belidor, in his 'Architecture [illegible] attributes the invention to the Dutch; but it [illegible] the contrivance to which he refers was a [illegible] and had little resemblance to what are now understood by locks. The invention has been also claimed for the Venetians and it is stated that Leonardo da Vinci, the painter, applied locks in 1497 in the Milanese canals.

A lock is a chamber formed of masonry, occupying the [illegible] of the canal where the difference of level is to be [illegible] This chamber is so contrived that the level of the water which it contains may be made to coincide with [illegible] upper or lower level of the canal. This is effected by [illegible] of gates, one of which pairs is placed at each end of the chamber of the lock. By this means, while the [illegible] the lower end of the chamber are opened, and those [illegible] upper end are closed, the water in the chamber will [illegible] at the lower level of the canal; and on the contrary, when the lower gates are closed and the upper gates are opened, the level of the water in the lock will coincide with the level of the water in the upper part of the canal. In the first case, a boat may be floated into the lock from the lower part of the canal, and if then the gates be closed and water is admitted into the lock from the upper level until the surface of the lock is in a line with the water [illegible] the boat will be floated up, and on the opening of the upper gates may be passed [illegible]. By reversing the course of proceeding, boats may be [illegible] conveyed from the upper to the lower level. When [illegible] operations are [illegible] quantity of water equal to the whole contents of [illegible] will have been lost from the upper level. It is [illegible] importance to economise as much as possible the [illegible] in lockage, and with this view, the size of the lock [illegible] be greater than is required for the accommodation of the boats in the canal. Still further to secure this necessary economy, where the width of the canal [illegible] admit it, the lock is made in two compartments, communicating with each other by a valve or gate, which can be opened [illegible] pleasure. By this means one-half of [illegible] which would otherwise be necessary to discharge to the lower le[illegible] may be transferred to the other compartment. This arrangement also saves time.

In carrying a canal through an undulating country, it is necessary to have recourse to deep cutting in some parts, and to form embankments in others. In such [illegible] the soil which is dug out in one place should be us[illegible] another, with the least possible degree of labour in conv[illegible]ing it; attention to this matter is necessary, in order [illegible] avoid, on the one hand, leaving spoil-banks or heaps to occupy the ground wastefully, and on the other hand, to obviate the necessity of making pits, which would be equally unprofitable.

It is necessary to construct, through the whole extent of the canal, a towing-path on one of the banks, which is generally made somewhat wider at the top than the other bank.

Experiments have been made with the view of determining the merits of canal carriage when compared [illegible] roads and with common roads. The results of these [illegible]ments, which are given in the following table, seem to [illegible] that at slow velocities the traffic of given weights is conducted more economically upon a canal than by the other methods of conveyance; that where the velocity exceeds four miles per hour, the economy turns in favour [illegible] roads; and that at high velocities the econom[illegible] disappears even when compared with the [illegible] quired on a level turnpike-road:—

Velocity of motion in Miles per Hour.	Weights moved by the application of equal f	
	On a Cana	
2½	55,500	
3	38,542	
3½	28,316	
4	21,680	
5	13,875	
6	9,635	...
7	7,080	...
8	5,420	...
9	4,282	...
10	3,468	...
13½	1,900	...

More recent experiments made upon the Ardrossan [illegible] Paisley Canal seem to indicate the superior economy of propelling boats properly constructed at high rates of velocity through the canal; but the results thus obtained have not perhaps been yet sufficiently tested to warrant a perfect reliance being placed upon them.

A canal can seldom be cut without the proprietors having previously obtained the sanction of Parliament, accompanied by authority to take at a proper valuation [illegible] land and premises as may occur in the line which it is intended to occupy. These acts make provision for compensating such parties as may be injured or interfered with by the canal, and in general (at least in recent acts) the proprietors are restrained from levying beyond a fixed amount of toll upon goods. It has been proposed in the present session (1836) to provide that at certain intervals of time these rates shall be subject to revision by Parliament, in order to protect the public more effectually against a monopoly, which every such mode of transit when successful is likely to become, and which in [illegible] present are.

The following table exhibits, as nearly as the existing materials render [illegible] a list of the canals now in use in different parts of the United Kingdom, their length, the difference between the highest and lowest levels, the number of locks, the dates when made, and the extreme points between which they run. Some very short cuts are omitted.

CANALS O[illegible]

[illegible]	Counties through which [th]ey are made.	Length, in Miles.	Surface Breadth, in Feet.	[illegible]	[illegible]	Number of Locks.	[illegible]	Finished.	REMARKS.
[illegible]	[illegible]lamorganshire	6¼	..	..	40		793		Connected with the Glamorganshire Canal, at a short d[illegible] from the aqueduct of the latter, [illegible] about ¼ of a mile from A[illegible] a railroad, 2 miles lo[illegible] to th[illegible] furnaces.
Alford (projected)	Lincolnshire					sea-lock			To comm[illegible] ¼ a mile S. of Alford, [illegible] terminate in the German Ocean [illegible] lock.
Audover	Hampshire						789		It commences near And[illegible] and [illegible]nates at Redbridge, where it enters the tideway of Southampton water.
[illegible]de-la-Zouch	Leicestershire and Warwickshire								Commences in the parish of Ashby-de-la-Zouch, and terminat[illegible] the Coventry Canal, at Marston Brid[illegible]
Ash[illegible]under L[illegible], and branches	La[illegible]shire	6¼ 8			162½ 83		793	1805	This canal connects the towns of Man[illegible]chester and Ashton; near the latter to[illegible] it joins the Huddersfield Canal. there [illegible] branches terminating near Oldham and Stockport.
	Yorkshire					91			[illegible]om the Calder, ¼ of a mile [illegible] field Bridge, to Baruby Bridge, in [illegible]wnship of Cawthorne.
	[illegible]ampshire and Surrey					29	793	796	Commences at Basingstoke, and terminates in the Wey, 1¼ miles S. of the village of Weybridge.
[illegible]ayl[illegible]	Sussex	3¼							This canal begins at B[illegible]ybridge, [illegible] terminates at Binesbridge, where [illegible] navigation of the Avon commen[illegible]
[illegible]	Warwickshire and Staffordshire	[illegible]					769½		Commences near Birmingh[illegible] and [illegible]minates in the Staffordshire [illegible]tershire Canal, 1¼ miles from [illegible] there are several branches[illegible]
Birmingham [illegible] Fazeley	Warwickshire and Staffordshire	20½							Commences at the easte[illegible] Old Birmingham Canal, and [illegible] the Wyrley and Essingto[illegible] Whittington: it communica[illegible] Coventry Canal, near Fazel[illegible]
(Walsall br[illegible]h)	Staffordshire								
[illegible] and Liver[illegible]	Staffordshire, Shropshire, and Cheshire					27			Commences in the Sta[illegible] Worcestershire Canal, near Te[illegible] terminates in the Chester Canal, [illegible] Acton.
Bra[illegible]						10	771		Commences at Bradford, and terminates in the Leeds and Liverpool Canal, [illegible] Shipley.
Brecknock and Abergavenny	Brecknockshire and Monmouthshire								Commences in the Monmouthshire Canal, 1 mile S. of [illegible], and terminates at Brecon, near which place it communicates with the Hay railway.
Bridgewater's (The Duke of), [illegible] a branch to Le[illegible]	Lancashire and Cheshire	38½			82¼	10	7[illegible]	776	This canal commences at Ma and terminates at Run
Bridgewater and [illegible]	Somersetshire	12½			35				above Bridgewater, ton. Another canal mencing in this, and [illegible] Chard.
Britton	Glamorganshire								Commences in the [illegible] the town of Neath, Swansea Harbour.
Bude Harbour and Canal	Cornwall and Devonshire						1819		Commences in Bu an
	Lincolnshire								[illegible]ences on the New navigation, near Cross nates at Moortown,
	Cumberland				70		819		Commences at near Bowness, [illegible]
	Nottinghamshire, Yorkshire, and Derbyshire					65		776	Commences in the near Stockwith, and term terfield.
							1792		Commences at Coombe Hill, nates in the Severn.
						14	1783	1790	Commences at Coventry, and at Fradley Heath, in the Trent sey Canal.
	[illegible]ghamshire and [illegible]shire	18					790		Commences in the Erewash its junction with the Nott and terminates at Cromford.
[illegible]	Kent and Surrey	9¼				98	1801		Commences in the Grand Su near Deptford, and terminates at
	Yorkshire	9¼				20	1793	1804	Commences in the Dun navigat the Barnsley Canal, near
	Derbys	8¼ 12¼	44	5		12		1794	Commences in the T[illegible] Canal, near Swarkstone Derby, and continues 3¼ miles beyon Little Eaton, where it terminates; one branch goes from Derby to the Erew Canal on the E.; there are likewise lateral branches to different collieries.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	56¼	8	[illegible]		Commences at Droitwich, and ter nates in the Severn, at its junction w the Shiwarp.
Dudley	[illegible] and Wor	[illegible]	[illegible]	[illegible]	R. 31 F. 13¼ F. [illegible]	[illegible]	[illegible]		Commences in the Worcester and Bir mingham Canal, near Selly Oak, and municates with the Birmingham C near Tipton Green; from [illegible]h proceeds to
Branches									

CANALS.	Counties through which they are made.	Length, in Miles.			Difference of elevation, in Feet.	Number of Locks.	Date.		
[illegible]	Cheshire, Denbighshire, and Shropshire	61			292		1777		Commences in the tideway of the Mersey, at [illegible]mere Port, and terminates in the Montgomery Canal. It has likewise several colla[illegible]anches
E[illegible] [illegible] Nutbrook	Derbyshire & Nottinghamshire	11¾ 4½			109 131	13 13	1777		Commences at [illegible] for Langley Bridge, and term[illegible] Trent, opposite the [illegible].
Glamorganshire	Glamorganshire	25			611		1790	1794	Commences at Merthyr-Tydvil, and ends in the tideway of the Taff, near its entrance into Penarth Harbour.
Glastonbury	Somersetshire	13¼				2, one of which is a tide-lock.	1827		The Brue is made navigable to High Bridge, a distance of nearly a mile. Thence a canal is made to Glastonbury.
Gloucester and Berkeley (Ship)	Gloucestershire	16¼			level		1797		Commences from the Severn, about 3 miles N. of Berkeley, and terminates, at Gloucester, in a spacious basin, out of which there is a lock into the Severn.
Grand Junction			43		R. 190 F. 166	98	1792	180[illegible]	
Branches:—									
Paddington	Northamptonshire, Buckinghamshire, Hertfordshire, and Middlesex.	13½				1	..		Begins at Braunston, where it unites with the Oxford Canal, and ends in the Thames, near Brentford.
Wendover		6½				..	..	1799	
Aylesbury		6			95	16	..		
Northampton		5			112		..		
Buckingham		10			13		..		
	Surrey						1807		Commences on the S. bank of the Thames, at Rotherhithe, and terminates at Addington Square, Camberwell Road.
Grand Union	Leicestershire and Northamptonshire	45			R. 51 F. 76	17	1810	1814	Unites with the Leicester Union Canal, about [illegible] miles from Market Harborough, and terminates in the Grand Junction Canal, at Long Buckby.
Grantham	Nottinghamshire, Leicestershire, and Lincolnshire	30			147¼		1793		Begins at Grantham, and ends in the Trent, at Nottingham. It has a branch to Bingham.
Gresley	Staffordshire	..			..		177[illegible]		From Apedale to Newcastle-under-Lyne.
Hereford and Gloucester	Herefordshire and Gloucestershire	16			195¼		179[illegible]	1798	Commences in the Severn, at Gloucester, and is continued to Ledbury.
Horncastle	Lincolnshire	11			level		1792		From the Old Witham, near Tattershall, to Horncastle.
Huddersfield	Yorkshire and Cheshire	19¼			R. 334¼ F. 436	33 12	1794		Begins at Huddersfield, and ends in the Ashton-under-Lyne Canal, near Dukinfield Bridge.
Ivelchester and Langport	Somersetshire	7					1795		Commences in the [illegible], below Langport, and terminates at Ivelchester.
Kennet and Avon	Wiltshire and Berkshire	57	44	5 to 6	R. 210 F. 404	32 48	1796	1810	Begins at Newbury and terminates in the Avon, about a mile from Bath. It communicates with the Wiltshire and Berkshire Canal, at Semington.
Kidwelly	Caermarthenshire						1766		From Kidwolly to Pwll [illegible], and, communicating with this [illegible], [illegible] to Pembrey. There are also tram-roads to mines in the neighbourhood.
Lancaster	Westmoreland & Lancashire	76			R. 222 F. 66	passed by a railway and inclined plane.	179[illegible]		Commences near Kirby-Kendal, and passes through Lancaster to Preston; here the canal is interrupted for about 4½ miles, but it is connected by a railroad to its continuation, which proceeds [illegible] S. to Wigan: near this place it joins the Leeds and Liverpool Canal.
Leeds and Liverpool Leigh branch	Yorkshire & Lancashire	127 7	42		R. 413 F. 433½	56		181[illegible]	Commences at Leeds Bridge, where it unites with the Aire and Calder navigation, and terminates at Liverpool, after a circuitous course, passing by Bingley, Skipton, Colne, Blackburn, and Wigan. A branch commences [illegible] mile from Wigan, and joins, at Leigh, that branch of the Duke of Bridgewater's Canal which extends from Manchester to Leigh.
Leicestershire & Northamptonshire Union Branch	Leicestershire & Northamptonshire	17 4					179[illegible]	1800	Begins at West Bridge, in the town of [illegible] and there communicates with the Soar River, which is made navigable (partly by cuts) to Loughborough; it terminates in the Grand Union Canal, near Gumley Hall. A branch to Market Harborough was made in 1805.
Leominster	Herefordshire & Worcestershire	37			R. 496 F. 48		1796		Commences at Kington, passes by Leominster, and terminates between 8 and 9 miles from Stourport. Short lines of railway extend [illegible] the present termination to the coal pits in the neighbourhood.
Leven	Yorkshire	3					180[illegible]	180[illegible]	From Leven to the River Navigation.
Liskeard and Looe	Cornwall	5¼			156	25	1825		From Tarras Pill to Liskeard.
	Lincolnshire	14			56¼	..	1763		From the Humber, near Tetney Haven, to Louth.
London and Cambridge (projected)	Essex and Cambridgeshire	45¼	44		165¼	52	181[illegible]		To commence at the town of Bishop's Stortford, in the canal there, and terminate in the Cam, at Clayhithe Sluice: there is to be a branch to Whaddon.
Macclesfield	Cheshire	29½			113¼	13	1826		From the Peak Forest Canal to the Trent and Mersey Canal.
Manchester, Bolton, and Bury	Lancashire	15			189¼	18	1791		Commences at Manchester, in the Mersey and Irwell Navigation, and terminates at Bolton: there is a branch to Bury.
Market Weighton	Yorkshire	11			nearly level	4	1772		Begins at Market Weighton, and ends in the Humber, opposite the mouth of the Trent.
Monmouthshire	Monmouthshire	17¼			447		1792		Commences in the Usk River, a short distance from Newport, and terminates near Pontnewynydd, where it joins the Abergavenny and Brecknock Canal. Several branches and railroads are made from this canal, to various ironworks and mines.

CANALS.	Counties through which they are made.	Length, in Miles.		Depth, in			Date.		REMARKS.
Montgomeryshire	Montgomeryshire	27			225	15			Unites with a branch of the Ellesmere Canal, in Llanyblodwell parish, and terminates in the Severn at Newtown.
Neath Canal Navigation	Glamorganshire	14						1798	Begins near Aberna[illegible] and ends in the Neath, near the town of [illegible].
Newport Pagnell	Buckinghamshire	1¼			50¼				Commences at [illegible] and terminates at Linford, [illegible] the Grand Junction Canal.
North Walsham and Dilham	Norfolk						181[illegible]		Commences at Wayford Bridge, in Dilham parish, where it communicates with the Ant, and terminates at Antingham.
North Wilts	Wiltshire				57				From the Wilts and Berks Canal, at Swindon, to the Thames and Severn Canal, near Weymoor Bridge.
Nottingham	Nottinghamshire	14			133			1802	Commences at the Cromford Canal, and terminates in the Trent, near Nottingham.
Branch		2¼			..			..	
Oakham	Leicestershire & Rutlandshire				126	17	1793	1803	Commences at Oakham, and terminates in the Melton Mowbray Navigation, at Melt
Oxford	Oxfordshire and Warwickshire		28	6 to 4½	R. 74 5 F. 195	42	769	1790	Commences in the Coventry Canal at Longford, and terminates in the Thames, at Oxford.
Peak Forest	Derbyshire & Cheshire	14¾					794	1800	Begins at the town of Ashton under Lyne, in the Manchester Canal, and terminates in Peak Forest.
Pocklington	Yorkshire	8½							Commences in the Derwent, at East Cottingwith, and terminates at Pocklington
Portsmouth and Arundel (main line)	Sussex and Hampshire	11¾	33	4½ to 8					Commences from the tideway of the Arun, 3 miles from the sea, and continues to Chichester Harbour. The channels from the end of this main line round Thorney Island, and to the end of the Portsea Canal, are 13½ miles.
Portsea branch		2½		10					
Chichester branch		1¼							
Regent's	Middlesex	8½					818		Begins in the Paddington Canal, near the Harrow Road, and locks into the Thames, at Limehouse.
Rochdale	Yorkshire & Lancashire	31½			R. 533¾ F. 353¾	78			Commences in the Calder Navigation, at Sowerby Bridge Wharf, and terminates in the Duke of Bridgewater's Canal, at Manchester.
Royal Military	Kent and Sussex	30	2 to 72		level.				From Shorncliff in Kent to Cliff End in Sussex.
St. Columb*	Cornwall	6							From Mangan Porth to St. Columb Porth.
Salisbury and Southampton	Hampshire								Commences at Southampton, and is continued at present only to Redbridge, where it joins the Andover Canal.
Sankey Brook Navigation	Lancashire	12		5½	78	8 and 2 double	755	1768	Commences at St. Helen's, and terminates in the Mersey, by a very circuitous route, passing Sankey Bridge. It was the first canal executed in England, and originally ended at the mouth of Sankey Brook. It is now extended to Runcorn Gap
Extension		3½			5¼	1 double	830	..	
Sheffield	Yorkshire				70	11	815	..	Connects the town of Sheffield with the river Dun.
Shrewsbury	Shropshire				R. 154 F. [illegible]	partly locks, partly inclined planes.	793		Commences at Shrewsbury, near the Ellesmere Canal, and joins the Donnington and Shropshire Canals at Rockwardine Wood.
Shropshire	Shropshire				R. 333 F. 207	3 inclined planes.	1788	792	Begins in the Donnington Canal, in the parish of Lilleshall, and unites to the Severn at Coals Port, below Coalbrook Dale.
Somersetshire Coal	Somersetshire				130	23	1794		Commences in the Kennet and Avon Canal, near Bradford, to Paulton; a railway branches off to collieries at Welton and Clandown.
Staffordshire and Worcestershire	Staffordshire and Worcestershire	46¼			R. 294 F. 100¼	44	1766	772	Commences in the river Severn, at Stourport, and unites with the Trent and Mersey Canal, near Haywood.
Stainforth and Keadby	Yorkshire & Lincolnshire	15			nearly level.	2	1793		Commences at the Dun Navigation, near Stainforth, and communicates with the Trent, at Keadby.
Stroudwater	Gloucestershire				102¼		1730		Commences at the Severn, near Fram[illegible]brad, and terminates in the Thames and Severn Canal, at Wallbridge, near Stroud.
Stourbridge	Staffordshire Worcestershire		28		191¼		776		Begins near Stourbridge, and joins the Staffordshire and Worcestershire Canal, near Stourton.
Stratford-upon-Avon	Warwickshire & Worcestershire	23½			309		1795		Commences at King's Norton, about [illegible] miles from Birmingham, where it joins the Worcester and Birmingham Canal, and terminates at Stratford.
Swansea	Brecknockshire & Glamorganshire	17			373		1794	1798	Commences in Swansea Harbour, and terminates at Pen Tawe.
Tavistock	Devonshire	4			256		1803	181	Begins in the tideway of the Tamar, and terminates at the town of Tavistock: there is also a branch.
Branch to M		2							
Thames and Medway	Kent	7½			level.		1804		From the Thames, at Gravesend, to the Medway, near Rochester.
Thames and Severn	Gloucestershire and Wiltshire	30			R. 243 F. 134	28 14	1783	1789	Commences in the Stroudwater Canal, near Stroud, and locks down in the Thames and Isis Navigation, at Lechlade.
Trent and Mersey, or Grand Trunk	Cheshire, Staffordshire, & Derbyshire	93			R. 326 F. 324	91	[illegible]	1777	Begins where the Derwent falls into the Trent, and terminates at Preston Brook, where it communicates with the Duke of Bridgewater's Canal: in its course it communicates with other principal canals also.

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* St. Colomb's Canal, though of short extent, is found very useful for the exporting of minerals, and conveying sand and other manure to the adjoining lands. (Priestly's *Historical Account of Canals*, p. 5[illegible].)

CANALS.	Counties through which they are made.	Length, in Miles.			Difference of Elevation.	Number of Locks.	Date. Projected.	Date. Finished.	REMARKS.
Ulverstone	Lancashire	1¼	65	15	level.	sea lock.	1793	..	Commences in Morecambe Bay, in the Irish Sea, and terminates at Ulverstone.
Warwick & Birmingham	Warwickshire	22½			R. 168 F. 42	27 5	1793	1799	Commences in the borough of Warwick, and joins the Digbeth branch of the Birmingham Canal, at Birmingham.
Warwick and Napton	Warwickshire	14			132½	[illegible]	1794	1799	Commences at the Warwick and Birmingham Canal, in the parish of Budbrook, and joins the Oxford Canal, near Napton.
Wey and Arun	Surrey and Sussex	18			..	23	1813	..	Begins in the Wey, between Guildford and Godalming, and ends in the Arun Navigation, at New Bridge.
Wilts and Berks	Wiltshire and Berkshire	52	27½		R. 170 F. 205	41	1801	..	Commences in the Thames, at Abingdon, and terminates at Semington, in the Kennet and Avon Canal; it likewise has several branches.
Wisbech	Cambridge	6			level.	2 flood-locks.	1794	..	Commences in the Nene River, at Wisbech, and terminates in the Old River, at Antwell.
Worcester and Birmingham	Worcestershire	29	42		428	71	1798	..	Commences in the junction of the Birmingham and Birmingham and Fazeley Canals, at Birmingham, and ends in the Severn, a little below Worcester: it also communicates with the Dudley and Stratford-upon-Avon Canals.
Wyrley and Essington	Staffordshire	24	28	4½	306	36	1792	..	Commences with the Coventry Canal, near [illegible]ford, and terminates in the Birmingham Canal: it has likewise several branches.

CANALS OF SCOTLAND.

CANALS.	Counties through which they are made.	Miles.	face Br in Feet		Diff ce of El vat , in Feet	ber of	Date.		REMARKS.
Aberdeenshire	Aberdeenshire	19	23		168	17	1796	1805	[illegible] in the harbour of Aberdeen, in the tideway of the mouth of the Dee, and ends in the Don, at Inverurie.
Borrowstowness	Linlithgowshire and Stirlingshire				level.		1768		From the harbour at Borrowstowness, to the Forth and Clyde Canal, at Grangemouth.
Caledonian	Inverness-shire	60½	120		Summit level, Loch Oich, 91 feet above sea-level.	28	1803	1822	Commences in the tideway of Loch Eil, at the N. end of the Loch, and terminates in the Mu[illegible] Frith, at Inverness. Of the whole len[illegible] rather more than 23 miles are artificially formed; the remaining line is formed by natural lakes, which are connected by means of this canal.
Crinan	Argyleshire	9¼		12 to 15	R. 59 F. 59	15	1793		Made across an isthmus in Argyleshire, lying between Lochs Crinan and Gilp, and connecting them.
Edinburgh and Glasgow Union	Stirlingshire, Linlithgowshire, and Edinburghshire				110	11	1817		Commences in the sixteenth lock of the Forth and Clyde Navigation, about 2 miles W. of Falkirk, and terminates in a basin at Edinburgh.
Forth and Clyde	Dumbartonshire, Lanarkshire, and Stirlingshire	35			R. 155 F. 156	39	1768	1790	Commences in the Forth, in Grangemouth Harbour, and locks down into the Clyde, at Bowling's Bay, near Dalmuir Burnfoot: this canal opens a communication between the Irish Sea and German Ocean.
Branch to the Monkland Canal, at Glasgow		2½							
Glasgow, Paisley, and Ardrossan	Ayr, Renfrew, and Lanarkshire				level.		1806		Commences at Tradestown, on the W. side of Glasgow, passes through Paisley and terminates at Johnstone; here a railway joins it, which is continued to the harbour of Ardrossan: the railway is 23½ miles long.
Glenkens	Kirkcudbrightshire	25½				15	1802		Commences in the tideway of the Dee, near Kirkcudbright, and is continued to Loch Ken, through which the navigation is continued for 12 miles; thence another canal extends to the Boat Pool at Dalry, where it terminates.
Monkland	Lanarkshire	12			183¼	10	1770		Begins at Old Monkland Coal-works, and proceeds to Glasgow, where it communicates with a branch of the Forth and Clyde Canal.

CANALS OF IRELAND.

CANALS.	Counties through which they are made.	Length, in English Miles.	Surface Breadth, in Feet.	Depth, in Feet.	Difference of Elevation, in Feet.	Number of Locks.	Date.		REMARKS.
							Projected.	Finished.	
Grand Branch to Athy	Dublin, Kildare, King's County, and Galway	87 14	40	6	278	39 and 5 double.	1756	..	Commences at Dublin, near the mouth of the Liffey, and crosses the Shannon near Banagher, terminates at Ballinasloe; there are also several branches.
To Robertstown, Mount Mellick, and other Branches	.. .. ..	[illegible]	..	..	..	..	..	..	
Royal Canal	Dublin, Meath, Westmeath, and Longford	83	44	6	322	42	1789	..	Commences at Dublin, and terminates in the Shannon at Tarmonbury.
Newry	Down and Armagh	12	30	5	65	13	1709	..	The navigation commences from the tideway at Fathom, 2¼ miles to Newry, having a sea-lock at each end, and is 17 feet deep; from Newry the Canal continues for 12 miles to the navigable river Bann, which, after a course of 9 miles from this point, runs into Lough Neagh, which is navigable 13 miles long and 8 broad, and which also communicates with Belfast by the Laggan Navigation; with the Tyrone collieries by the Blackwater; and with the town of Antrim by the Antrim.
Laggan Navigation	[illegible]	19¼	..	..	..	..	1729	..	The Laggan navigation extends from the tideway at Belfast into Lough Neagh.
Tyrone Colliery	Tyrone	6	..	..	..	8	1758	..	From Coal Island to the Blackwater for 3 miles, and thence by a short cut into Lough Neagh.
Ulster (now in progress)	Armagh, Monaghan, and Fermanagh	46	..	.	..	..	1832	.	Commences near Charlemont on the Blackwater, and terminates in Lough Ea

Besides the canals noticed in the foregoing tables, there are many rivers which have been made navigable by short cuts at different parts; others have had their channels turned, or canals made parallel to them, and several have been extended by branch cuts. These may almost be considered as canals, but a notice of them could not be given in the tables without increasing their length considerably.

(Nichols, Priestley, and Walker's *Historical Account of the Navigable Rivers, Canals, &c., of Great Britain*; *Parliamentary Reports on the Caledonian Canal, and on Improvements in Ireland*; C. W. Williams's *Observations on the Inland Navigation of Ireland*; Tatham's *Political Economy of Inland Navigation*; Phillips's *General History of Inland Navigation*.)

CANAL, ANTO'NIO, called Canaletto, was the son of Bernardo Canal, who, although descended from one of the noble families of Venice, followed the profession of a scene-painter. Antonio was born at Venice, but the precise date of his birth appears to be unknown; at his death, in 1768, he was aged 71. He originally followed his father's occupation; and the style of his early practice may be traced in the boldness and vigour of his later works, and the deceptive reality of the effect. About the year 1719, disgusted with the petty annoyances of the theatre, he abandoned it altogether, and went to Rome, where he employed himself for a long time in studying from the antient ruins. On his return home, he devoted himself to painting views in the city, and original compositions. In the latter part of his life he visited London, where he was in great estimation. Walpole imagines that one object of his coming was to invest part of the wealth he had acquired in the English funds.

His handling is light, bold, and firm; his colouring bright, true, and relishing; his figures well disposed. He has displayed no less art in his choice of subjects and sites, and disposal of all the separate parts, than in the treatment and execution. He sometimes used the *camera*, which enabled him to attain the utmost exactness in his linear perspective; but he used it discreetly, always correcting and improving the tints and aërial effects. In his pictures, the palaces of the Adriatic are brought before the eye with all the vivid beauty of the actual scene: and his original compositions, in which the antient and the modern are most happily blended, partake of the reality of his views. His works are very numerous, and are seen in every collection.

His pupil Guardi is the most eminent of his followers. He paints in a style which is brilliant and agreeable, but less solid and less exact than his master's. (Zanetti.)

CANALIRA. [ISOPODA.]

CANARA, a province on the west coast of Hindustan between 12° and 15° N. lat., and between 74° and 76° E. long. This province is bounded on the N. by Bejapore and the Portuguese territory; on the E. by Mysore and the Balaghaut ceded districts; on the S. by the Malabar province, and on the W. by the Indian Ocean. The length of the province along the coast from N. to S. is [illegible] miles, and its mean breadth is about 40 miles; the total area has been computed at 7380 square miles: of this area 4622 square miles are contained below and 2758 square miles above the Ghauts [GHAUTS.]

The province is divided into two districts, North and South Canara; the line of division is about 13° 40′ N. lat. The surface of Canara is rocky and uneven. On the high grounds red gravel prevails; near the coast the soil is sandy, but the valleys are well adapted for rice cultivation. There are several mountain streams in the province, but no rivers of consequence. The labour required to bring the land into cultivation is great, owing to the inequalities of the surface, which make it necessary to level the fields before they can be ploughed. If after the land has been brought under tillage it should be neglected for one or two years, it will be broken by numerous deep gullies formed by the torrents which fall during the monsoon. It is probably owing to the constant attention thus rendered necessary that each proprietor is obliged to reside upon his farm, and that the extent of the individual farms is very small. For the same reason the revenue derived by the government from the holders of the land is very inconsiderable.

The entire population of Canara in 1807 was 576,640 souls, of whom 396,672 inhabited the southern district. The proportion of Brahmins was computed at rather more than one-sixth of the whole population. About three-fourths of the remainder are engaged in cultivating the soil: one-fifth of these cultivators are slaves. The inhabitants of the sea coast are principally Mohammedans, and those of the interior Jains, one of the Hindu sects that are considered heretical by the Brahmins.

Almost the only production of the province is rice, for cultivating which the climate is peculiarly favourable, owing to the prevalence of rains. Land of the first quality yields two and sometimes three harvests of rice in the year. Inferior lands yield one crop of rice and another of some inferior grain annually. Cocoa-nuts, betel, and pepper are cultivated, but not extensively. The rent of land varies between one-fourth and one-half of the gross produce: it very rarely happens that the proprietor alters the assessment of a farm or removes the tenant, who is considered by custom to have a kind of right to the occupancy. Out of the rent paid by the tenant to the proprietors the latter contributes 60 per cent. to the revenue of the government, which thus receives from 15 to 30 per cent. of the gross produce of the land. When a farm is sold it usually brings as purchase money from eight to twelve years' net rent, the price varying according to the proximity of towns.

The chief towns are, in the north division Batticollah, and in the south division Mangalore and Barcelore. Batticollah stands on the sea-coast in 13° 55′ N. lat., and 74° 37′ E. long.; it is situated on the north bank of the Scandaholay, a small stream which waters a beautiful valley surrounded by hills. Mangalore is built on the margin of a salt lake, which is separated from the sea by a sandy beach in 12° 53′ N. lat., and 74° 57′ E. long. Mangalore is a place of considerable trade; the exports consist principally of rice, betel-nut, pepper, sandal-wood, and turmeric, to Muscat, Goa, Bombay, and the coast of Malabar. The imports consist of raw sugar and silk from Bengal and China, and of oil and ghee from Surat. The Portuguese had a factory at Mangalore, which was destroyed in 1596 by the Arabs from Muscat. In 1768 the town was taken by the English, but was immediately retaken by Hyder. In 1783 it again surrendered to the English, and was immediately thereafter besieged by Tippoo, and when at the conclusion of the war it was given up to that chief was little more than a heap of ruins. The fortifications have since been entirely dismantled. The population is estimated at 30,000 souls. Barcelore, supposed to be the Barace of the antients, is situated on the sea-coast 55 miles N. from Mangalore, in 13° 37′ N. lat., and 74° 47′ E. long.

The province of Canara, which till then had been subject to Hindu sway, was subdued by Hyder Ali, rajah of Mysore in 1763. On the death of his son Tippoo, in 1799, the whole province was placed under British authority; it has since remained in our possession, and in the enjoyment of uninterrupted tranquillity. The wars that had disturbed the province between its conquest by Hyder and its possession by the English had much reduced the population, and a considerable part of the country had been suffered to run waste and was overgrown with jungle. Since that time a great improvement has taken place in the numbers and condition of the people, which is shown by the better quality of their dress and greater attention to other comforts, as well as by a decrease in the number and atrocity of the crimes committed by them.

(Buchanan's *Journey through Mysore, Canara, and Malabar*; Mill's *History of British India*; *Reports of Committees of House of Commons on the affairs of India.*)

CANARIES, a group of islands in the North Atlantic Ocean, lying off the coast of Africa, between the parallels of 27° 40′ and 29° 30′ N. lat., and the meridians of 13° 30′ and 18° 20′ W. long. Lanzarota is the most eastern island of the group, and Ferro, from which the meridians used to be generally reckoned, is the most westerly.

These islands are by some supposed to be the Fortunate Islands of the antients; but others consider this name to refer to Madeira. Perhaps the Canaries however have the better claim, if we follow the description in Pliny (vi. 32), which is taken from Juba, the learned Mauritanian prince. Juba calls one island Nivaria, or Snow Island, which is probably Teneriffe; another island he calls Canaria, from the number of dogs of a large size that were found there; Juba had two of these dogs. It is probable that the Goths and Vandals who invaded the coasts of Mauritania may have been acquainted with this group; but the first account we have of them in modern times is about the year 1330, by a French ship which was driven among them by stress of weather. Upon this discovery a Spanish nobleman, Don Luis, Count of Claramonte, obtained a grant of the islands from Pope Clement VI., with the title of king. Nothing was however done towards making a settlement till 1385, when a fleet under Ferdinando Perara sailed from Cadiz and touched at Lanzarote, but was driven away by the natives. The next expedition was from Seville, in 1393, but no possession was taken of any of the islands. In 1400 another fleet sailed from Rochelle, under John de Bethencourt, and anchored at Lanzarote, where they built a fort at Point Rubicon. The adventurers then passed over to Fuertaventura; but being opposed by the natives they were obliged to re-embark. Bethencourt returned to Spain, and having obtained from Don Henry III. a grant of the islands, with the title of king, again sailed to Lanzarote with a large armament, and in June, 1405, passed over to Fuertaventura, of which he took possession. He next sailed to Grand Canary and Palma, from both of which he was driven by the natives. He was more fortunate at Gomora, where, to his surprise, he found several of the natives speaking Spanish. To account for this, it appears that about thirty years previously some Spanish vessels had touched at this island, and had left a priest there to convert the natives to the Romish faith. No written account of this visit exists.

Bethencourt next went to Ferro, or Hierro, where he was received in the most friendly terms by the natives; he left a garrison in the island, and returned to Fuertaventura. In November, 1406, he mustered all his forces to make another attempt on the Grand Canary, in which he was again unsuccessful, and in consequence returned to Spain to solicit assistance, but he died in 1408. The nephew of Bethencourt, in 1418, sold his right to these islands to Henry de Guzman, another Spanish nobleman, who expended large sums in endeavouring to subdue the other islands. He altogether failed in his schemes, though in 1461 the Spaniards went through the form of taking possession of Canary and Teneriffe.

Some difference having arisen between Spain and Portugal with regard to these islands, in consequence of a second sale of them by the nephew of Bethencourt to the latter power, the Portuguese arrived in force at Lanzarote to take possession; but the dispute was settled by treaty, in which the islands were ceded to Spain. After various other fruitless attempts to subdue the Grand Canary, a treaty of commerce was entered into with the chiefs of that island in 1476; but in the same year the court of Castille purchased the right to the three unconquered islands of Canary, Teneriffe, and Palma, and in the following year sent out a fleet to undertake the conquest of Canary, which however was not finally accomplished till April, 1483, seventy-seven years after the first descent on the island by John de Bethencourt.

In 1490 a fleet was equipped for the subjugation of Palma and Teneriffe, and arrived at Palma in September. Palma was taken about May following. The fleet then sailed for Teneriffe, in May, 1493, when this large island was reduced without bloodshed. Since this time the Canaries have always belonged to the Spanish crown, though several descents have at different times been made upon them, which have generally proved unsuccessful. Those nearest the African shores have been ravaged by Barbary corsairs.

This group consists of the following large islands:—Canary, Teneriffe, Palma, Ferro, Gomera, Fuertaventura, and Lanzarote. There are also some smaller islands, as Santa Clara, Alegranza, and Graciosa. The coasts of the islands are high and precipitous, but here and there broken by deep clefts. The mountains generally rise towards the centre of the islands, bleak and bare, and are full of pointed rocks. During the winter there is snow on several of the highest summits. The Peak of Teneriffe, a half-extinct volcano, rises to the height of about 11,400 feet, and as it is viewed from the sea at a distance, seems to spring out of the water like a sugar-loaf. They are all of volcanic formation, and in parts exceedingly fertile; they produce grain and fruits, both tropical and European, in abundance. A volcano burst out in 1824 in the island of Lanzarote. The vine is largely cultivated, and in most of the islands wine is made, which is well-known in Europe under the name of 'Teneriffe,' that island being the principal seat of the wine trade. Sugar is also made, and there are manufactures of coarse linens, cloths, and silks. An active trade is kept up among the islands, and they have large fisheries on the African coast. There are no close harbours, the anchorage being generally open roadsteads, few of which can be considered safe except during the fine season. The depth of water between the islands is very great, and the passages are good. Supplies of provisions, &c., may be obtained from any of them, though some of the islands are without water, and depend on rain, which they keep in tanks. All kinds of domestic cattle abound, though only goats and sheep were found there. Camels have been introduced, but do not thrive well. Each island has its governor; but the whole group is under a governor-general, who commonly resides at Teneriffe, though all the law courts are held at Canary. Being situated within the general limits of the trade-wind, these islands enjoy a fine climate, and are very healthy: in summer there is a land breeze off them at night. The S.W. winds, though rare, blow strong and bring rain, while the S.E. wind is dry and hot, like the sirocco of the Mediterranean. The inhabitants may now be considered as Spaniards, though after their conquest they did not endeavour to extirpate the aborigines, who were called Guanches, but intermarried freely with them after their conversion to the Romish faith. Owing to this intermixture, the Guanches have now ceased to exist as a separate people. Mummies of the aborigines, wrapped in goat-skins, have been found in caves in the mountains. At the time of Bethencourt's visit, the group was not under one government, but most of the islands were divided into one or more portions, governed by independent chiefs, and the boundaries were marked off by walls of loose stone. The inhabitants consequently differed considerably in manners and customs. Their clothing was goat-skins, and their weapons were slings, darts, spears, and clubs; they believed in one God, and polygamy was not allowed; they were social and cheerful, and fond of music. The present inhabitants are bigoted Catholics; the whole group forms a bishop's see, who is a suffragan of the Archbishop of Seville.

Comparative statement of the population of the Canary Islands from the year 1742 to 1835.

ISLANDS.	1742.	1768.	1802.	1835.	Increa in the 93 year	Centesimal ncrease.
Teneriffe	60,218	66,354	70,067	85,011	24,793	41·17
Canary	33,864	41,082	55,093	68,040	34,176	100·02
Palma	17,580	19,195	28,824	33,089	15,509	88·02
Lanzarote	7,210	9,705	16,160	17,431	10,224	141·80
Fuertaventura	7,382	8,863	12,451	13,885	6,503	88·09
Gomera	6,251	6,645	7,915	11,742	5,491	87·90
Hierro	3,687	4,022	4,006	4,444	757	20.53
Total	136,192	155,866	194,516	233,645	97,053	71·26

Table showing the annual proportion of deaths, &c., to the population.

	Proportion of Births to Population.	Proportion of Marriages to Population	Proportion of Deaths to Population.
Teneriffe	1 to 22	to 42	to 39
Canary	1 „ 21	„ 105	„ 35
Palma	1 „ 26	„ 192	„ 50
Lanzarote	1 „ 20	„ 117	„ 46
Fuertaventura	1 „ 21	„ 496	„ 42
Gomera	1 „ 23	„ 77	„ 31
Hierro	1 „ 24	„ 101	„ 41
Total	1 „ 23		

The number of monasteries in the Canary Islands is 41, in which there are 187 priests and friars of different ranks, and 13 noviciates. In 15 convents there are 210 nuns and 13 noviciates.

The following statement of the extent of each of the Canary Islands, with the number of houses and other buildings; and the quantities of the principal productions grown in one year, is taken from returns made to government by the British consul resident in the islands:-

Extent.

ISLANDS.	Greatest length.	[illegible]	[illegible]	[illegible]	Houses.	Cat dral	Chu	Mo ster	Nu ies	Hos als	
	League	Leagues.	Leagues.	Square Leagues							
Teneriffe	17	9	53	106	13,884	1		5	10		
Canary	12	11	40	91	11,119	1		7	3		
Palma	10	9	19	25	6,878			3	2		
Lanzarote	10	5	27	32	3,230			2			
Fuerta-ventura	26		61	79	2,490			1			
Gomera				10½	1,740			2			
Hierro				—	801						
Total.					40,142	2	88	41	15	15	62

Principal Productions in one Year.

ISLANDS.	Wheat.	Maize.	Barley.	Rye.	Vegetables.	Wine.	Potatoes.	Barilla.	Orchilla.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Pipes.	Qrs.	Quintals	Quts.
Teneriffe	17,123	7,659	5,020	1689	2,749	23,560	86,000	35,000	416
Canary	12,475	24,596	11,120	992	2,519	8,848	36,000	..	190
Palma	3,995	1,624	3,714	1120	1,820	5,128	16,000	..	135
Lanzarote	10,[illegible]	3,328	18,596	1012	2,072	3,720	10,000	46,000	123
Fuerta-ventura	12,172	1,040	24,100	110	320	220	3,000	33,000	290
Gomera	1,704	936	1,860	340	764	2,650	4,400	..	140
Hierro	96	[illegible]490	1,872	130	80	2,100	2,400	..	408
Total	57,497	29,876	66,2[illegible]	5343	10,310	46,226	161,800	114,000	1498

The extent of land in the whole of the seven islands is:—

	Fanegadas of 6100 Spanish yards.
Under cultivation	4[illegible],401
Uncultivated and common land, wooded	1,883,275

There are besides about 30,000 occupied by houses, streets, &c. making the whole extent 2,360,676 fanegadas, or 346⅗ square miles.

A summary of the Statistics of the Canary Islands.

DESCRIPTION.	Total of the Seven Islands.
	Rials Vellon.
Value of Agricultural Property	1,278,543,887
„ Property in Towns	405,816,400
„ „ in Cattle	32,041,180
Amount of Capital employed	21,500,000
Produce of Agricultural Property	39,478,930
„ Property in Towns	4,928,800
„ „ in Cattle	5,039,200
„ „ in Commerce	1,505,000
Annual Profit arising from 34 Vessels employed in the Fishery on the Coast of Africa	1,320,000
Produce of Fisheries, Birds, and Wild Animals caught (Cazas), and others	2,942,669
Amount of Municipal Revenues from Duties and from Real Property	265,900
Charges	407,952
Deficit	112,752
Amount of Ecclesiastical Revenues	3,217,870

A statement of the quantities of the several articles, the produce of the Island of Teneriffe, which were exported from the port of Santa Cruz to foreign countries, in the year 1833.

Quantities exported.

COUNTRIES.	ine. Pipes	and Pps.	Quintals	Barrels & Bags.	ine Pps.	E Quts	rchilla Qnts.	lbs	Bags.
London	1855		860				72	112	117
Hamburg	774	..	..	54					
United State	405	..	790	63					
Bremen	194	..		12					
St. Thomas	181	40			13	64			
Jersey	44	..							
Marseilles	40	..					60	760	..
Trinidad	60	..							
East Indies								..	..
Total	3561	47	1650	141				872	117

The importations and exportations to and from the whole of the islands during 1833 were as under:—

	Value of Goods imported to		Value of Goods exported from		
	Rials Vellon.	Maravedis	Rials Vellon.	Maravedis.	N.B. Ninety Rials Vellon at the par of exchange are equal to £1 sterling.
Foreign Countrie	11,573,228	9	5,870,185	18	
America	1,069,697	21	422,356	0	
The Peninsula	2,614,290	24	3,078,506	2	
Total	15,257,216	23	9,371,050	20	

The goods imported into the islands are sugar, coffee, brandy, corn, paper, soap, oil, candles, leather, fabrics in silk, woollen, flax, and cotton; glass, earthenware, &c.

The articles exported are silk, brandy, pulse, grain, fish, barilla, wine, Orchilla weed, &c.

Three other articles for exportation are of recent introduction in the islands. These are rock-moss (*mulgo*), tunny-fish (*atun*), and cochineal: the latter, feeding on the *Cactus Opuntia*, increased greatly during the year 1833. In that year 1275 lbs. were exported to the Peninsula.

The chief towns are Las Palmas, in Canary, with a population of about 10,000; Santa Cruz, in Teneriffe, the seat of the governor, has a population of about 8500; and San Christoval de la Laguna, which stands on a high plain in the same island, has a population of near 9000; Orataya, near the foot of the high Peak, has about 7000 inhabitants. Santa Cruz is also the name of the chief town of Palma.

(Glas, *History of the Canaries*; Humboldt's *Travels*; Von Buch's *Description of the Canaries*.)

CANA'RIES, in music, a quick dance-tune, in three-eight time, said to have been imported from the Canary

Islands, though [illegible] ability it was exported thither from Normandy by [illegible] de Bethencourt, who invaded them at the close of the fourteenth century. Purcell has, in his 'Dioclesian,' introduced the *Canaries*. His tune is in two strains of eight bars each, in three-eight time.

CANARY BIRD, or CANARY FINCH—*Le Serin de Canarie* of the French, *Der Canarienvogel* of the Germans, *Canario* of the Italians, the *Canary* of the English, *Fringilla Canaria* of Linnæus*—the well-known songster which is to be found caged in every house where the inmates are fond of song-birds. The Canary Islands are the most frequented haunts of the species. In the wild state the prevailing hue, according to the observations of Adanson, Labillardière, and others, is grey or brown, mingled however with other colours, but never reaching the brilliancy of plumage exhibited by the bird in captivity; a brilliancy arising from long domestication and repeated crosses with analogous species. Its introduction into Europe is stated by some to have taken place in the 14th century; but Bechstein names the beginning of the 16th†. 'The arrival,' says the author last quoted, 'of the canary in Europe, is thus described:—A vessel which, in addition to its other merchandize, was bringing a number of these birds to Leghorn, was wrecked on the coast of Italy, opposite the island of Elba, where these little birds, having been set at liberty, took refuge. The climate being favourable they increased, and would certainly have become naturalized, had not the wish to possess them occasioned their being caught in such numbers that at last they were extirpated from their new abode. From this cause Italy was the first European country where the canary was reared. At first their education was difficult, as the proper manner of treating them was unknown; and what tended to render them scarce was, that only the male birds were brought over,—no females. The grey of its primitive colour, darker on the back and greener on the belly, has undergone so many changes from its being domesticated, from the climate, and from the union with birds analogous to it (in Italy with the citril finch, the serin; in our country (Germany) with the linnet, the green-finch, the siskin, and the goldfinch, that now we have canaries of all colours. If we had not sufficient proof that canaries came originally from the Fortunate Islands, we should think the citril finch, the serin, and the siskin, were the wild stock of the domesticated race. I have seen a bird whose parents were a siskin and serin, which perfectly resembled a variety of the canary which is called the green. I have also seen mules from a female grey canary, in which was no trace of their true parentage. The grey, the yellow, the white, the blackish, and the chestnut, are the principal varieties, and it is from their combination, and from their tints, that we derive the numerous varieties that we now possess. Those canaries that have the upper part of the body of a dusky green or linnet-brown, and the under part the yellowish green of the green-bird, with dark brown eyes, are the strongest, and most nearly resemble the primitive race. The yellow and white often have red eyes, and are the most tender. The chestnut are the most uncommon, and hold a middle rank for strength and length of life, between the two extremes. But as the plumage of the intermediate ones is a mixture of these principal colours, their value depends on the pretty and regular manner in which they are marked. The canary that is most ad[illegible] amongst us now is one with the body white or yel[illegible] head, particularly if crested, wings and tail, yellowish [illegible]; the second in degree is of a golden yellow, with the head, wings, and tail black, or at least dusky grey. Next follow the grey or blackish, with a yellow head and collar; and the yellow with a blackish or green tuft, which are very much valued. As for those that are irregularly spotted, speckled, or variegated, they are much less sought after, and are used to pair with those of one colour, white, yellow, grey, brown-grey, and the like.'

The usual length of a canary is about five inches, of which the tail measures about two and a quarter. The bill is about five lines in length, strong, sharply pointed, and inclining to white. The shanks or feet, as they are technically called, are about eight lines long, and of a flesh-colour.

The female is very like the male, but is generally less bright in colour, smaller about the head, shorter about the neck and body, not so high on the shanks, and altogether of a form somewhat less elegant than that of the male. There is a bean-shaped feather under the bill, and the temples and circles round the eyes are deeper in colour than the other parts of the body.

HYBRIDS.

1. *Mules bred from a hen Canary and a Goldfinch.*—These partake of the parental colours on both sides. The finest are produced from yellow or white hen canaries. 'The most beautiful,' says Bechstein, 'that I have seen was greyish ash-colour in the middle of its crest, and silvery white on the rest of its head and nape; a broad orange border surrounded the beak, and the neck was adorned with a white collar; the back was a dusky grey with black streaks; the rump white, the under part of the body of a snowy whiteness; the under tail-coverts, the wings, and first quill-feathers white, but the others, as well as the coverts, black edged with yellow; the middle of the wing was also adorned with a beautiful golden-yellow spot; the white tail had a black spot on the sides, the white beak was tipped with black, the feet were white. The mother of this beautiful bird was white, with a greenish-grey crest.'

2. *Mules bred from a hen Canary and a male Siskin.*—The young always resemble the siskin in shape. If the mother be green they will be like a hen siskin; if she be white or yellow, they will be lighter in colour than a siskin, without however any great difference.

3. *Mules bred between a hen Canary and a Green-bird, or a Citril-finch.*—When the mother is neither white nor yellow the young do not differ much from the grey or green canary; but they are generally rather more slender, and their bills are also shorter and thicker.

4. *Mules bred between a hen Canary and a Linnet.*—These, if the mother be white or yellow, will be speckled; if she be grey, they will resemble her generally, but their tails will be longer.

Most of these mules are fruitful, and there is no great difficulty in getting the parents to pair; but when the union is with species more remote, the difficulty increases in proportion.

The following unions have in a certain degree succeeded.

5. *Mules between a hen Canary and a Bullfinch.*—Bechstein states that an ardent bullfinch will sometimes yield to the allurements of a very ardent hen canary, and that he has himself witnessed it, observing, however, that the eggs seldom prove fruitful. But Dr. Jassy, of Frankfort, obtained mules of a bullfinch and canary, by making other canaries sit on the eggs and bring up the young, a plan pursued in Bohemia. 'My bullfinch,' writes Dr. Jassy to Bechstein, 'is so attached to the female canary that he mourns all the time they are separated, and cannot bear any other bird.' In this union tufted or crested females

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* Dr. Heineken (*Zoological Journal*, vol. v. p 70) considers *Fringilla Canaria* and *Fringilla butyracea* as synonyms, and he there gives an elaborate description of the bird as it appears in Madeira. Of its habits Dr Heineken says, that it builds in thick bushy high shrubs and trees, with roots, moss, feathers, hair, &c; that it pairs in February, lays from four to six pale blue eggs, and hatches five times (not unfrequently six) in a season. He observes that it is very familiar, haunting and breeding in gardens about the city. 'It is a delightful songster,' says the Doctor, 'with, beyond doubt, much of the nightingale's and sky lark's, but none of the wood lark's song, although three or four sky-larks in confinement in Funchal are the only examples of any of these three birds in the island, and notwithstanding the general opinion that such notes are the result of education in the canary: it is in full song about nine months in the year. I have heard one sing on the wing, and passing from one tree to another at some distance, and am told that during the pairing season this is very common. Each flock has its own song, and, from individuals in the same garden differing considerably, I suspect that of each nest varies more or less. After the breeding season, they flock along with linnets, goldfinches, &c., and are then seldom seen in gardens. The moult takes place in August and September. An old bird caught and put into a cage will sometimes sing almost immediately, but seldom lives longer than the second year in confinement. The young from the nest are difficult to rear, dying generally at the first moult. They cross readily with the domesticated variety, and the progeny are larger, stronger, better breeders, and, to my taste, better songsters also than the latter; but a pure wild song from an island canary, at liberty, in full throat, and in a part of the country so distant from the haunts of men that it is quite unsophisticated, is unequalled, in its kind, by any thing I have ever heard in the way of bird-music.'

In the last edition of Montagu's Ornithological Dictionary (1833) it is stated that the Fringilla Canaria of Linnæus, whose habitation is said by Gmelin and Turton to be India, is not this species, but an apparently spurious one. In the twelfth edition of the Systema Naturæ the habitat assigned to *Fringilla butyracea* is 'Madera,' and that allotted to Fringilla Canaria is the Canary Islands, 'Habitat in Canariis Insulis.' In Gmelin's edition, India and the Cape of Good Hope are the localities given to *F butyracea*; but the Canary Islands are still stated to be the habitat of *F. Canaria*. 'Habitat in Insulis Canariis, aliisque maris Atlantici, in littore Africæ orientali, per omnem Europam familiaris, longæva, egregie cantans,' &c. &c.

† Professor Rennie, in his edition of Montagu, thus writes on this part of the subject:—'The original stock is said to have been imported from the Canary Isles, about the 14th century; a circumstance not mentioned by Belon, and discredited by Syme, for these reasons. The wild birds found in the Canary Isles, says he, bear less resemblance in song and plumage to the domestic canary than to the siskin of Germany, the venturon of Italy, or the serin of France. The plumage of these is a mixture of yellow, green, and very little brown or grey; whilst the wild canary has a plumage of dingy greenish grey. One of these birds, which I received from St. Michael's, sang very much like the linnet.'

should not be chosen, because the top-knot would be very unbecoming on the large head of the mule.

6. *Mules between a hen Canary and a Nightingale?*—Bechstein possessed a nightingale which, having been for a long time shut up with a female canary, lived very sociably with her, singing as usual. He paired with her in Bechstein's presence, but the eggs were unproductive, and Bechstein expresses his intention to try the plan of giving the eggs to another sitter, if the same thing should happen again.

Besides the birds above enumerated, chaffinches, yellowhammers, &c., have been tried, but with no good success. The author last above-quoted says that he never saw a male canary very fond of a female yellowhammer, nor a male of the latter kind of a female canary, though the plumage may be selected so as to offer a striking resemblance.

It will be observed, that in all the six instances recorded the canary is always the mother. The reason why breeders select the male of the other species when mules are desired, is because, though a female siskin, or goldfinch, &c., might not and probably would not object to the union, she could not easily be induced, if at all, to lay her eggs in an artificial nest, like a canary.

Before we conclude our notice of the hybrids, we must again refer to the alleged fruitfulness of some of the mules, such as those of serins, citril finches, and goldfinches, a very interesting subject to the physiologist, who has, in following out this point with the canary bird and her different mates, an opportunity of observing how far these hybrids have the power of continuing their mixed forms. The first eggs of these hybrids are said to be very small, and the young hatched from them very weak. The eggs of the next year are said to be larger, and the nestlings stronger and stouter.

For breeding, a male aged from two to five years is chosen by the experienced. If a young male be introduced among older females, the offspring will consist of more males than there are females. The signs of age are rough and blackish scales on the feet, and elongated strong claws. It is not common to meet with good males, and such are valuable. Many cocks are mopes, and seldom sing; and their indifference to their hens is repaid by a similar indifference to them on the part of the latter. Some are violent, beating and often killing their hens and nestlings: while others, from an excess of ardour, teaze their hens while they are sitting, or tear the nest and destroy the eggs, in their vexation at the incubation abstracting the attention of their mate; these often produce at last so much excitement in the females, that the latter abandon their eggs.

Good hens are not less valuable and scarce. Some of the ardent ones lay, but will not sit; others, after hatching their nestlings, neglect to feed them, or beat them and pick out their feathers, so that the hapless young die wretchedly. To some, again, laying is so painful, that they are too much fatigued to sit, or suffer long intervals to elapse between the times of depositing each egg.

In order to obtain bright and good plumage, those birds whose colours are clear and whose spots are clean and well defined should be placed together. A brownish-grey or greenish bird paired with one of a lively yellow often produces young of a dim white, and of other admired colours. Two crested birds should never be joined, for their offspring are frequently hatched with part of the head bald, or otherwise deformed in plumage.

Bechstein gives the following directions for forwarding the breeding of canaries:—'The best time for pairing canaries is the middle of April. Either one male, and one or two females, are placed in a large cage, or many of both sexes are united in a room or aviary, having the advantage of a south aspect. Nests made of turned wood, or osiers, are given them, as straw ones are too easily torn. It is a good plan to place in the room or aviary slips of pine, which being cut in February do not lose their leaves. If a little inclosure of wire-gauze can be fixed over the window, where the birds can enjoy the fresh air, nothing will more effectually contribute to render the young healthy and robust. Birds which are to be paired for the first time should be previously placed in the same cage for seven or eight days, in order to become acquainted and accustomed to live together. If two females are to be caged with one male, it is especially necessary that they should be together long enough to leave off quarrelling, and the pairing-cage should be divided into two equal parts, communicating by a sliding door. This being done, a lively male and one of the females should be placed in the first division; as soon as she has laid, the male should be moved into the other division, the door of separation being shut: but as soon as the other has also laid, the door may be left open: the male will then visit the females alternately, and they will not trouble themselves about each other; but, without these precautions, jealousy would incline them to fight and destroy each other's eggs. When it is intended to place a great many females, double or treble the number of males, in a room or aviary, the latter should always be first paired with a single female, which will ever after remain the favourite; and it will only be when she is about to sit that he will pair with the others; and this is all the notice he will take of them, for afterwards he will only notice their young. It is from these mothers however that the most and the best birds are generally procured. If the floor of the room or aviary is well covered with moss, little else need be added for making the nests, otherwise they should be supplied with the hair of cows and deer, hog's bristles, fine hay, lint, wool cut two or three inches long, paper-shavings, and the like. That which is coarsest serves for the outside, and the softest and finest for the inside. If they have shrubs, traces of the natural instinct of the canary are soon observed in the nests, which they construct without the help of the turner or basket-weaver; but they are of an inelegant form, and the outside is not very carefully finished. The females alone, as is usual among birds, are the builders, the males only choosing the situation and bringing the materials. It is in the nest, where the female is in continual motion, that the pairing takes place; she invites the male by constant little chirpings, repeated more quickly the nearer she is to laying. Seven or eight days are generally reckoned from the first pairing to the laying of the first egg; the other eggs, whose number varies, without exceeding six, are laid successively every following day, and often at the same hour. The laying ended, pairing continues during the first days of incubation. If the pairs agree, they must be left entirely to themselves, without endeavouring to use art to help nature, as many do. It is usual to take away the first egg and substitute an ivory one, which is repeated with the others to the last, preserving them in the mean time in a box filled with fine dry sand: they are afterwards restored all together to the nest to be hatched.' Upon this practice the translator of Bechstein's interesting and useful work observes in terms of censure, quoting Buffon in support of his opinion, because the plan above recommended causes the mother a greater loss of heat, and burdens her at once with five or six little ones, which coming together disturb rather than please her; whereas in seeing them hatched successively one after the other, her pleasure is increased, and her strength and courage are supported. 'Very intelligent bird-fanciers,' adds Buffon, 'assure us, that by not removing the eggs from the female, and leaving them to be hatched in succession, they have always succeeded better than when they have substituted ivory eggs.' The hen canary will generally lay three or four times in the year, from April to September, and some will even continue to lay during their moult. The eggs are of a delicate sea-green hue, spotted at one end more or less with violet or maroon colour. About the eighth day after the hen has begun to sit, the eggs may be examined by holding them between the flame of a candle and the eye. Those which are good will by that time exhibit well-developed blood-vessels, whereas the bad ones will continue clear, or be already addled—these should be thrown away. It may be doubted however whether the better course be not to leave the hen quite undisturbed. The cock will sometimes take his turn for some hours in the day; but the hen seldom approves of this: as soon as she has taken her hasty meal she flies back to the nest, and if the male, whose capabilities as a hatcher she seems strongly to question, do not retire, she pecks him till he does. On the thirteenth day the young generally make their appearance. While incubation is going on, the place where the birds are confined should be kept quiet; for it is asserted that sudden jarring noises, such as the violent slamming of a door, or the discharge of a gun, will kill the young in the shell. We have above seen that it is usual to give two females to one male; and it is alleged that, if one of the former should happen to die during incubation, the survivor immediately takes charge of the eggs, to the care of which she so entirely devotes herself, that she repels the caresses of her mate, whose solace she was while the deceased was sitting.

As soon as the young break the shell, two jars should be placed near the feeding-trough. In one of these there should be a quarter of a hard egg, yolk and white together, chopped very fine, with a bit of crumb of white bread or biscuit, which has been soaked in water, and afterwards well pressed to get out the moisture. In the other jar rape-seed, well boiled and then washed in fresh water, should be placed: great care must be taken not to let this food become sour, which would destroy the nestlings. The cock-bird is the principal nurse after hatching.

It is sometimes necessary to bring up the young by hand, and then a paste should be made of white bread or biscuit pounded very fine, rape-seed well bruised, a small quantity of the yolk of an egg, and water. The nestlings must be fed with a quill cut into the shape of a spoon, and should not have less than ten or twelve meals a day: four beaksful well piled up on the quill constitute a meal. On the thirteenth day they will begin to feed themselves, and in four weeks they may be removed to other cages. Care however must be taken to supply them for some time with the paste above described, together with the food of full-grown birds, as a sudden privation of the former has been known frequently to occasion death; especially if the nestlings are deprived of it when moulting.

The translator of Bechstein says, 'It sometimes happens in very dry seasons that the feathers of the young birds cannot develop naturally: a bath of tepid water, employed on such an occasion by Madame ——, was so successful, that I cannot do better than recommend it. The same lady succeeded equally well in similar circumstances in hatching late eggs; she plunged them for some minutes in water heated to the degree of incubation, and immediately replaced them under the mother: in a short time she enjoyed the pleasure of seeing the little ones make their appearance. This interesting experiment may be applied to all sorts of birds, and may be particularly useful in regard to those of the poultry-yard.'

About the thirteenth or fourteenth day, by which time the nestlings can eat alone, the males begin to warble and so do some of the females, but in a more disjointed style. The males, which may then be easily distinguished, should be forthwith separated, each bird being placed in a cage by himself (which must be first covered with a piece of linen and afterwards with a darker curtain) apart from every other bird, in order that his education may begin, if it is intended that his natural song should be superseded by an artificial melody: if he is left unseparated beyond the fourteenth day he will retain a portion of his father's song, and murder his acquired melody by intermingling the paternal notes. His musical lesson must be repeated five or six times in the day, especially in the morning and evening, his master performing the desired air either on a flageolet or a bird-organ; but, as has been observed in the case of the bullfinch, if the instrument be not in perfect tune the whistling of a man of taste is infinitely preferable. From two to six months, according to the memory and the abilities of the scholar, will be spent in this musical education. Some canaries have been thus taught to repeat correctly two or three airs, and others have learned to pronounce distinctly a few short words; for they possess great quickness and correctness of ear, and have excellent memories.

When the more natural song is preferred, those canaries are most esteemed which introduce into their warblings the notes of the nightingale, wood-lark, or tit-lark, and this may be easily accomplished by placing those birds near the young canaries. The canaries of the Tyrol are more frequently taught to introduce the notes of the nightingale, while those of England more frequently interweave those of the wood-lark. 'In Thuringia,' says Bechstein, 'the preference is generally given to those which, instead of a succession of noisy bursts, know how, with a silvery sonorous voice, to descend regularly through all the tones of the octave, introducing from time to time the sound of a trumpet. There are some males which, especially in the pairing season, sing with so much strength and ardour, that they burst the delicate vessels of the lungs and die suddenly.'

Canaries may be made to sing in the night—some do this of their own accord. The tuition must commence early in their youth by covering the cage and thus keeping them in the dark during the day long enough for them to be hungry; they are thus brought to feed by candle-light, and at last sing. The hen birds will also sing, particularly in the spring, but in an unconnected style. Old hens past breeding will often sing in this way the year round.

There are societies in London for promoting the breeding of canaries, and amateurs distinguish upwards of thirty varieties.

London criterion of a perfect canary.—Professor Rennie, in the article above alluded to, mentions two sorts of canaries, 'the plain and variegated, or, as they are technically called, the gay spangles or mealty, and jonks or jonquils. These two varieties are more esteemed than any of the numerous varieties which have sprung from them; although birds of different feathers have their admirers, some preferring beauty of plumage, others excellence of song, certainly that bird is most desirable where both are combined. The first property of these birds consists in the cap, which ought to be of fine orange colour, pervading every part of the body except the tail and wings, and possessing the utmost regularity, without any black feathers, as, by the smallest speck, it loses the property of a show bird, and is considered a broken-capped bird. The second property consists in the feathers of the wing and tail being of a deep black up to the quill, as a single white feather in the wing or tail causes it to be termed a foul bird; the requisite number of these feathers in each wing is eighteen, and in the tail twelve. It is however frequently observed that the best-coloured birds are foul in one or two feathers, which reduces their value, although they may still be matched to breed with.' These form the leading features of excellence; but it is generally the custom of the societies above-mentioned to award the prize to the competitor who produces a bird nearest to the model published by them the season prior to that wherein the competitors are to show for the prize.

For the diseases to which these pretty songsters are subject and their remedies we must refer the reader to Bechstein's excellent little book,* from which we have largely drawn, and to Professor Rennie's article in the last edition of Montagu. Some may perhaps think that we have devoted too much space to our canary birds: but, independent of the many physiological points of interest which the subject presents, one reason has, we confess, weighed greatly with us. The rich may indeed add the breeding of canary birds to their other manifold amusements, but we have thought of most of our poorer brethren while writing this article. In our great manufacturing towns there are thousands to whom the care of these interesting songsters would be a pleasing relief after the noise of the loom and the din of the workshop. It is a gratification within the reach of the English artisan: his German neighbours have long made the management of song-birds one of their principal recreations, while, notwithstanding the societies above alluded to, they are comparatively neglected in this country.

CANARY-GRASS. [PHALARIS.]

CANARY GRASS (*Phalaris Canariensis*) is an annual grass, cultivated for its seeds, with which tame birds are fed, especially canary birds. The consumption of this seed is so considerable as to make it an article of commerce. Canary seed is chiefly cultivated in the Isle of Thanet in Kent, and about Sandwich. It requires a good soil, neither too light nor too wet, and an open country, without many hedge-rows: for small birds are so fond of the seed, that where they abound it is scarcely possible to protect the crop from their depredations. The plant grows like a strong grass, with an oval spike at the extremity of the stem. The seeds are closely enveloped by a strong chaff or husk, from which they are not easily separated; they are oval and pointed at both ends, and of a bright straw colour. The kernel of the seed is pleasant to the taste, and has the flavour of nuts.

Canary grass has been tried in a green state for cattle, but besides the price of the seed, which is high compared with that of other grasses, it has not been found sufficiently abundant or nutritious to make it preferable to any of the grasses usually cultivated for that purpose. When sown for the seed it is best sown in drills, at the distance of eight or nine inches from each other; this admits of hoeing, by which the quantity of seed produced is much increased, and it is kept free from the admixture of weeds. When it is reaped it is left for some time in heaps or wads, and exposed to the dews: this does not injure the seed, and by softening the husk facilitates its separation by threshing. The same effect may be produced by breaking off the heads from the stem with the flail, and pressing them close in casks or bags before they are perfectly dry; a slight fermentation takes place which renders the chaff brittle, and after some time the seed comes out very readily. The same thing is done with clover seed. The produce of an acre of canary seed is from three to five quarters.

CANCALLE or **CANCALE**, a town in France, in the department of Ille et Vilaine, is on the coast, a very few miles E. of St. Malo, and just at the entrance of that deep bay which seems to take its name indiscriminately from Avranches and Cancalle. The town has to the N. the small headland called Grouin de Cancalle, and on the E. the sea, which here forms a small roadstead. Cancalle is known for ysters; Paris is supplied from it; and the English t thither for the purpose of purchasing oysters, which are deposited in the beds in the mouth of the Thames, or else pickled and put up in small barrels. Population, in 1832, 4880 for the whole commune.

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* Translation, London, Orr and Smith, 1835.

In 1758, the English, under the command of the duke of Marlborough, landed near Cancalle, and fortified a post near the town; they then approached St. Malo, but finding the town too strong for a *coup de main*, which was the object of their landing, they burnt the shipping under the walls of the town (amounting to 100 sail, many of them privateers), and some magazines of naval stores, and returning to Cancalle re-embarked without opposition.

CANCELLARIA. [Entomostomata.]

CANCER, called also *carcinoma*, and *lupus* because it eats away the flesh like a wolf, a disease of a malignant character, the real nature of which, after all the observation and research of the surgeon, still remains wholly unknown. The term has been used with little discrimination, and the true nature of the malady not being understood, its diagnostic or distinctive characters are accordingly vague and indefinite. There is indeed a morbid structure induced by the disease which is quite peculiar, and therefore diagnostic; but unfortunately this can be perceived only after death, or after the excision of the affected part. However, surgeons are now agreed that cancer exists under two distinct forms, one of which is termed *schirrus* or *occult* cancer, and the other cancer properly so called, that is, *ulcerated* or *open* cancer.

Schirrus is an indolent, hard, and nearly insensible tumor, accompanied with little or no discolouration of the surrounding skin. It commonly commences as a small hard knot in the part which it attacks, and from this minute spot spreads in all directions like rays from a centre. In this state it has little or no pain, and it may be either distinctly circumscribed and moveable, or blended with the surrounding substance, and scarcely at all moveable.

As the disease passes from an indolent into a more active state the size of the tumour enlarges; its surface generally, though not invariably, becomes unequal; pain begins to be felt in it, slight at first, recurring at intervals, and progressively increasing, being always of a shooting or lancinating kind; the skin acquires a purple or livid hue: the cutaneous veins enlarge, become what is termed varicose, and spread out over the livid and puckered skin in such a manner as to present some likeness to the body of a crab with its claws extended, whence it has received the name of cancer. The most characteristic marks of a true schirrus then are puckering of the skin over the tumour, dull leaden colour of the integuments around it, knotted uneven feel of the tumour, and occasional darting pains through it. If to this assemblage of symptoms be added a uniform resistance to all the remedies employed to disperse the tumour, a constantly progressive enlargement of the tumour, and a manifest tendency to involve contiguous parts in the same morbid condition, the evidence of the true nature of the malady will be indubitable.

The rapidity of the progress of a schirrous tumour to open cancer is different in every different case. Sometimes indeed, the induration remains in the state of schirrus for many years, and even to the termination of life, the skin never actually breaking. At other times the interval is short from the first discolouration of the skin to its termination in the state of ulceration, or the formation of open cancer.

The carcinomatous ulcer consists of a large chasm formed in the substance of the part in which the malady is seated, the chasm being produced partly by a sloughing and partly by an ulcerating process. The opened tumour is now found to consist of cells; as these cells burst and pour out their contents, which consist of a pulpy matter of different degrees of consistence and of various colours, the surrounding parts are irritated by an excoriating ichor. This discharge sometimes takes place with a celerity which would induce the belief that it can scarcely result from the process of secretion. When the diseased actions have in a manner exhausted themselves an attempt at reparation appears to take place, analogous to those which, [illegible] other cases, lead to the restoration of a part from a diseased to a healthy state. New flesh is formed, but instead of healthy muscle it consists of a fungus of peculiar hardness; the formative vessels communicating to the new product the same qualities as to the tumour previously generated by their morbid action. This diseased fungus occasionally even cicatrizes, and so arrests for a time the progress of the disease. But the morbid action, though mitigated or suspended, is not subdued; it soon recommences its destructive course, and the part never returns to a healthy condition. In the meantime the disease extends through the medium of the absorbing vessels, and by their agency is propagated to parts at a considerable distance from the original tumour.

In the progress of the ulceration a good deal of blood is often lost from the destruction of the coats of the blood vessels. A burning heat is felt universally over the ulcerated surface, the source of unceasing torment. The shooting lancinating pains, sufficiently distressing in the occult state of the disease, now increase both in degree and constancy, and the strongest constitutions ultimately sink under the progressively augmenting irritation and suffering.

When a section is made in a schirrous tumour, in the early stage of its formation, its central portion is found to be more compact and harder than the other parts of its substance. This central portion, which often does not exceed in magnitude the size of a silver penny, is nearly of the consistence of cartilage, and from this centre radiate in all directions white, firm, ligamentous bands, which are crossed by transverse bands of a somewhat fainter appearance, and in this manner is formed a kind of net work, in the meshes of which the new-formed substance is enclosed.

In an advanced stage of the tumour the whole of the diseased part has a more uniform structure; no central point can be distinguished; and the ligamentous bands which extend in every direction, and which are still very apparent, do not follow any regular course, or at least not distinct enough to be traced.

When the tumour passes into the state of ulceration the central part of the ulcer consists of a small irregular cavity, which is filled up with a bloody fluid, the edges of the cavity being hard, jagged, and spongy, and exquisitely painful. 'Beyond the edges of the cavity there is a radiated appearance of ligamentous bands, diverging towards the circumference; but the tumour nearer the circumference is more compact, and is made up of distinct portions, each of which has a centre surrounded by ligamentous bands in concentric circles.'

This disease is seated chiefly, though not exclusively, in parts which have a glandular structure. It is much more frequent in the female than in the male. Its most common seat in the female is the breast, and in the male the lips. Six times as many cancerous affections, says Mr. Benjamin Bell, occur in the female breast and in the lips as in all the rest of the body together.

The causes of the disease are involved in the same obscurity as its intrinsic nature. There sometimes appears to be an hereditary predisposition to it. Though no age be exempt from it, since it takes place at all periods of life, from five years old to fifty and upwards, yet it is certainly most common at the more advanced than at the earlier periods of life, and in the female especially it most frequently occurs about the period of the cessation of the catamenia, being manifestly connected with that disturbed balance of the circulation which takes place at this epoch in the female system.

It would be out of place to discuss here the palliative treatment of a malady which is commonly conceived to be susceptible of no cure. The knife of the surgeon, however, can sometimes extirpate a disease the fatal progress of which cannot be arrested by human skill. The suffering produced by the apprehension of being the subject of an incurable and painful disease must be mitigated by the knowledge that in the great majority of cases the malady may be removed by an operation which is hardly ever attended with danger. Formerly, indeed, there was but little encouragement to undertake or to undergo this operation. 'Of near 60 cancers,' says Dr. Alexander Monro, who wrote about a century ago, 'which I have been present at the extirpation of, only four patients remained free of the disease at the end of two years; three of these lucky people had occult cancers in the breast, and the fourth had an ulcerated cancer on the lip.'

Finding that this vast proportion always relapsed, and that of the great majority of those who relapsed the disease became more virulent and made a quicker progress than it commonly did in those on whom no operation had been performed, this distinguished surgeon naturally proposes the question—'Whether ought cancerous tumours to be extirpated, or ought the palliative method only to be followed?' How different the result of modern surgery! Out of 88 genuine cancers extirpated by Mr. Hill from different parts of the body, all of which were ulcerated excepting four, all the patients excepting two recovered from the operation. Of the first 45 cases only one proved unsuccessful; in three more the cancer broke out again in different parts; and in the fifth there were threatenings of some tumours at a distance from the original disease. All the rest of the 45 continued well as long as they lived. Of the next 33 one of them lived only four months; in five more the disease broke out afresh after having once healed. 'The reason why out of 45 cases only four or five proved unsuccessful, and six out of 33, was,' says the operator, 'because the extraordinary success I met with made cancerous patients resort to me from all corners of the country, several of whom, after delaying till there was little probability of a cure by extirpation or any other means, forced me to perform the operation, contrary both to my judgment and inclination.'

'From these and many other authenticated facts,' says Mr. B. Bell, who saw many of Mr. Hill's cases, and who bears witness to the accuracy of his statements, 'there is very great reason for considering the disease in general as a local complaint, not originally connected with any disorder of the system; and if in every case of real cancer recourse were had to the operation as early as possible, that is, soon after the appearance of the affection, and before the formation of matter takes place, the return of the malady would probably be a very rare occurrence.'

These statements place in a strong light the paramount importance of attending to the very first indications of this dreadful distemper, and the folly of concealing, as is too often the case, especially on the part of the female, from a feeling of false delicacy, the existence of a malady which, if neglected, will be sure to terminate in death, attended with agonizing suffering; but which, if properly treated in the commencement, may be easily removed. (See Pearson's *Practical Observations on Cancerous Complaints*; Abernethy's *Surgical Works*; Sir E. Home's *Observations on Cancer*; and Cooper's *Dictionary of Practical Surgery*.)

CANCER in the domesticated quadrupeds is oftenest observed in the bitch, and every character and stage of it may be satisfactorily traced. A small, hard, insensible, isolated tumour is felt in one of the teats. It seems to give no pain, and causes no kind of inconvenience; it is not larger than a pea, perhaps not of greater size than a millet seed. During many months it seems scarcely or not at all to grow, but it never retrogrades. After an indefinite period of time however it begins evidently and rapidly to increase, and smaller ones may be detected at its base. It then assumes an irregular figure, and the whole, or portions of it, become hard—of a schirrous hardness, and perfectly incompressible; other portions are soft, perhaps hollow, and cellated. At length a portion of the tumour begins to become prominent and soft. It is intensely red, then purple, and after a while it breaks, and discharges a corroding ichorous fluid. The tumour is evidently disorganised deeply within its substance, and a cancerous ulcer, with an irregular elevated edge, is established. Perhaps it heals in the course of eight or ten days, but it soon opens afresh, wider and deeper, and at length the animal is destroyed, either by the general irritation which is established, or by the contamination of the circulating fluids, which are speedily effected by the vitiated secretion of the part.

Iodine, which has so much power in dispersing glandular and many other tumours, is inert, whether applied externally to the cancerous tumour or ulcer, or administered internally, in order to affect the constitution. The excision of the tumour is generally useless after it has acquired any considerable bulk, for it will appear on examination that the constitution is affected, and that the nuclei of other tumours are to be found in the other teats. After the ulcerative process has been once established the case is perfectly hopeless. Even if the nuclei of new enlargements cannot be felt, the animal will nevertheless soon perish, from the development of the disease internally, or, to speak more properly, from metastasis of the disease.

The only effectual mode of treatment is to remove these nuclei as soon as they are perceived, and before the system can be contaminated.

The cause of cancer in these cases is the comparative inactivity of certain parts, which nature intended to be actively and usefully employed. At every period of [illegible] in the bitch there is a secretion of milk in the teats. [illegible] not being drawn away in the natural process of suckling, the fluid is long detained in the teats, irritates them by its presence, and produces this specific and fatal inflammation. Hereditary predisposition, over-feeding, and sometimes external violence, are sources of schirrous tumours.

Cancer is found also in the vagina and uterus of the bitch, and occasionally canker in the ear assumes the character of true cancerous ulcer. All applications and operations are perfectly useless.

In the teats of the cat, cancer establishes itself to an extent that would scarcely be thought credible. The whole of the external surface of the belly often presents one horrible mass of cancerous ulceration.

The horse is subject to cancer in the eye, and the scrotum externally; and the kidney, and the vagina and the uterus, and particularly the pyloric orifice of the stomach internally. The symptoms by which the presence of internal cancer might be indicated are not known, and if they were, no medical skill could arrest the evil.

Cattle and sheep are subject to cancer of the jaw, the eye, the scrotum, and the udder externally; and of the pyloric orifice of the fourth stomach internally.

CANCER, the Crab, the fourth constellation of the zodiac, being one of those in Ptolemy. From the end of January to that of April, its time of coming on the meridian in this country varies from midnight to six in the evening. In the obsolete and useless division of the ecliptic into signs, Cancer is the part of that circle between 90° and 120° from the vernal equinox. The surrounding constellations are Hydra, Leo, Lynx, Gemini, and Canis Minor.

There are edifying mythological stories in Hyginus, &c. [ZODIAC.] The mythology of the minor constellations is hardly worth a reference.

In the following list, the letters in parentheses are those which are not in Bayer:—

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi (), Bradley [].	Astron. Society.			Flamsteed, Piazzi (), Bradley [].	Astron. Society.	
	1	970	6	σ^1	46	....	6
ω^1	2	976	6	δ	47	1066	4
	3	978	6	ι	48	1069	5
ω^2	4	979	6	b	49	1068	6
(r)	5	981	6	A^2	50	1072	6
	6	984	5		54	1082	7
	8	986	6	ρ^2	55	1083	6
μ^1	9	989	7	ρ^3	58	1087	6
μ^2	10	991	6½	(a^1)	60	1090	6
	11	992	7½	o^1	62	1093	6
(s)	12	993	6	o^2	63	1094	6
(ψ^1)	15	999	6	α	65	1097	4
ζ	16	998	5½	ν	69	1100	6
β	17	1008	3¾		75	1107	6½
χ	18	1011	6	κ	76	1106	6½
λ	19	1012	6	ξ	77	1109	[illegible]
d^1	20	1016	6		78	1108	[illegible]
(f)	21	1017	6		79	1111	[illegible]
ϕ^1	22	1022	6½	π^1	81	1116	[illegible]
ϕ^2_1	23	1024	6	π^2	82	[illegible]	[illegible]
	24	1025	6	(q)	83	1130	6
d^2	25	1023	6		(3)	997	7
(e)	27	1028	6		(14)	1004	7
υ^2	28	1031	6½		(42)	1013	[illegible]
	29	1033	6½		(67)	1026	6
υ^3	30	1034	5		(124)	[illegible]	7
θ	31	1035	5½		(129)	[illegible]	7
η	33	1037	6½	ζ	(136)	1058	7
(h)	34	1038	6		(179)	1080	7
c^1	36	1045	6		(180)	1081	7
c^2	37	....	6½		(191)	1086	7
(o)	38	1048	8		(206)	1088	7
	39	1050	6		(224)	1098	7
	40	1051	6		(261)	972	7
ϵ	41	[illegible]	7		(267)	975	7
γ	43	[illegible]	4		[1299]	[illegible]	6
A^1	45	1062	6				

ANCER, TROPIC OF. [TROPICS.]

ANCER. [CRAB.]

CANCROMA. [BOAT-BILL.]

CANDA. [CELLARIÆA.]

CANDAHAR. [AFGHANISTAN.]

CANDEISH, or KHANDEISH, a province of Hindustan, between 20° and 22° N. lat., and 73° and 77° E. long. It is bounded on the N. by Malwa, on the E. by Berar and Gundwana, on the S. by Aurungabad and Berar, and on the W. by Gujerat. Its length from E. to W. is about 210 miles, and its average breadth about 80 miles. This province is described in the Ayin-i-Akbari as the soubah of Dandees, which was originally named Khandesh, but received the name of Dandees when the capital, Aseerghur, was taken by the Emperor Akbar. [ASEERGHUR.]

Candeish is generally a level country, but is nearly surrounded by mountains. On the N. it has the Satpoora or Injadri range; on the S. the range on which the fort of Chandore stands, and the Ajuntee ghaut; on the S.W. are the Syadree Mountains, forming part of the Western Ghauts; and in continuation of these, on the S. side of the Tuptee river, are the hills of Baglana. Low sterile hills are scattered over the plain of Candeish, but with this exception the province is very fertile. In addition to the Tuptee and the Nerbudda the province is watered by several copious streams, which flow from the table-land and fall into the Tuptee.

This country, which was once inhabited by a numerous and thriving people, has of late years been rendered a scene of desolation. The ravages committed by Jeswunt Rao Holkar in 1802 caused a famine in the following year, which carried off a large proportion of the inhabitants. After this the Bheel tribes, whose chiefs command most of the passes in the mountain range to the N., and the Pindarries were accustomed to make periodical incursions into the plains for plunder. In 1818, Candeish, then among the possessions of Holkar, was ceded to the British, but the Arabs, who had previously obtained a footing in the country, opposed the British authority, and it became necessary to undertake their subjugation. Although not numerous, their retreats in the mountain-fastnesses render it difficult to subdue them, and it was not until the end of 1819 that the British had quiet possession of the province. At that time nearly one half of the villages had been abandoned to the tigers, which swarmed throughout the land. Where luxuriant harvests formerly grew, an impenetrable jungle had sprung up, and although the government has since held out every inducement to cultivators by granting land upon easy terms, it will be a long time before all the mischief can be repaired.

The principal towns in the province are, Boorhanpore, Aseerghur, Hindia, Nundoorbar, and Gaulna. [BOORHANPORE, ASEERGHUR.] Hindia is situated on the S. bank of the Nerbudda, where its channel is 3000 feet wide, in 22° 26′ N. lat., and 77° 5′ E. long. This place is chiefly important from its position, as commanding some of the best fords across the Nerbudda; its defences are by no means strong. Nundoorbar contains about 500 houses, and was formerly a place of much greater extent. The wall by which it was surrounded is now, for the most part, in ruins. This town is in 21° 25′ N. lat., and 74° 15′ E. long. Gaulna was once a large town, but has fallen greatly to decay. The fort stands on a high rocky mountain, and is surrounded by a wall of stone and brick 20 feet high and a mile in circumference. The town, which lies under the N. side of the mountain, is surrounded by a mud wall and towers. The place is abundantly supplied with water, which is preserved in tanks.

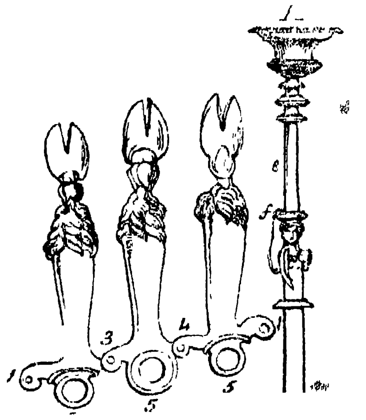
(Mill's *History of British India; Institutes of Akbar; Reports of Committees of House of Commons on the Affairs of India.*)

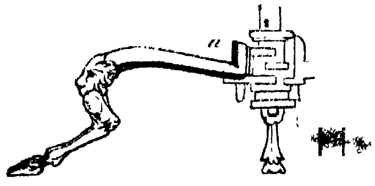
CANDELA'BRUM, an article of furniture used by the antients both in their public edifices and private dwellings. The candelabra used in public edifices were usually of a greater size, and made with a large cup at the top to receive a lamp or sufficient unctuous material to feed a large flame: they were also probably employed for burning incense in the temples. Candelabra have been found in the private dwellings discovered at Herculaneum and Pompeii consisting of tall slender bronze stands, sometimes with a flat circular top. In other instances they have a vase-like top, also flat, or with a socket, and projecting feet at the bottom of the long stem on which the light was placed. The flat the top was called by the Greeks *pinakion*, or 'little table' (Πινάκιον or Πινακίδιον). The forms of candelabra were varied in all possible ways to please the taste of the wealthy: sometimes the stand was a human figure, holding in one hand the cup or receptacle of the oil, and ornamented with gilding:—

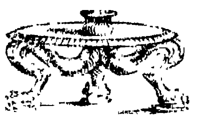
> 'Si non aurea sunt juvenum simulacra per aedeis
> Lampadas igniferas manibus retinentia dextris,
> Lumina nocturnis epulis ut suppeditentur.'
>
> (Lucretius, ii. 24.)

These candelabra or lamp-stands, 'in their original and simple form, were probably mere reeds or straight sticks fixed upon a foot by peasants to raise their light to a convenient height. 'Sometimes the stem is represented as throwing out buds; sometimes it is a stick, the side branches of which have been roughly lopped off, leaving projections where they grew.' 'Some have a sliding shaft, like that of a music stand, by which the light might be raised or lowered at pleasure.' The annexed cut represents two bronze candelabra, one of a simple form, the other in some measure complicated. 'The base is formed of three goats' legs, each having a ring at each end, 5, 5, 5. The centre piece is attached to the side pieces by rivets, 3, 4, round which these rings are allowed to turn, so that the three lie either parallel when the candelabrum is taken to pieces, or may be made to stand at equal distances in the circumference of a circle, in which case the two exterior rings lap over each other, and are united by a moveable pin. The end rings, 5, 5, 5, which are placed at different heights, as shown at *h*, will then be brought into the same vertical line; and the round pin, *c*, which terminates the stem, passes through them and is secured by a pin, 7, passing through the hole, 8, which keeps the whole tight.' The shaft is square and hollow, and surmounted by two busts. Within this lower shaft a smaller shaft, *e*, plays up and down, and is fixed at any desired height by the pin, *f*. (*Library of Entertaining Knowledge—Pompeii*, vol. ii. pp. 295-6.)

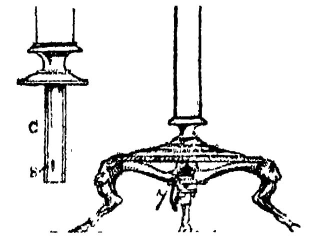
The annexed cut of a marble candelabrum is from Piranesi's work, 'Vasi, Candelabri, Urne, Tripodi, ed altri Or-





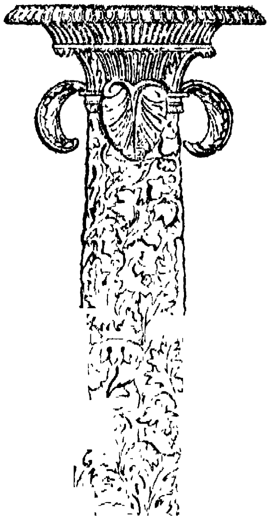


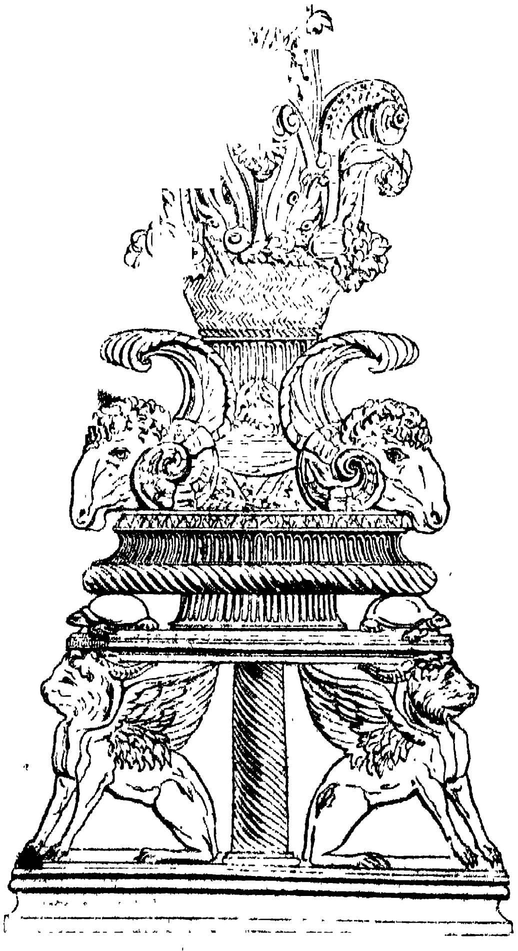
[Bronze Candelabrum from Herculaneum.]



[A, moveable Candelabrum; C, moveable shaft; 1 1, connecting joints of the legs.]

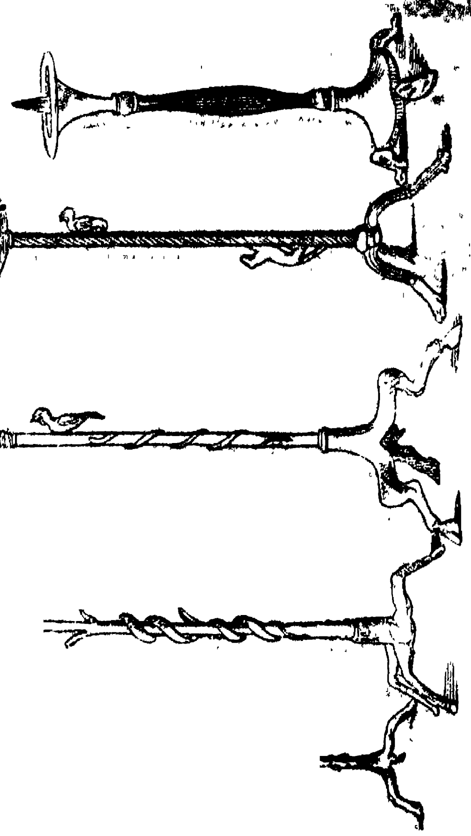
namenti Antichi,' 2 vols. fol. atl., Roma, 1778. In these works excessive richness in the design and delicacy in the execution are often combined. Two exquisite works of candelabra, carved in marble, are preserved in the Radcliffe Library, Oxford. The fragments of which they are composed were found in the villa of Hadrian at Tivoli, and were presented to the university of Oxford by Sir Roger Newdigate.





[Marble Candelabrum, from Piranesi's works.]

It appears that a smaller kind of candelabrum was used as an altar. (See bas-relief engraved in the *Museo Chiaramonti*, vol. i.; also p. 56, note 24. The plates xxxvii., xxxviii., xxxix., xl., vol. vii., *Museo Pio Clementino and Chiaramonti*, contain representations of antient candelabra. (See also the dissertation of Ch. Monsignor Gaetano Marini, *Sopra gli Usi de' Candelabri.*) The marble candelabrum in the Townley collection of the British Museum is about seven feet high, with a representation of a large flame on the top. In the Townley collection there are also several bronze candelabra from twelve inches in height to upwards of five feet, and of various patterns. They are mostly flat on the top, although some are formed with a cup-like top, as if for a large flame. One has a spike to receive a clay lamp, with a hole in the centre. There is also one formed upon the principle of the lamp represented in the cut, so that it can be raised or lowered at pleasure. In all, there are about seventeen lamps, of which some of the annexed engravings are representations. In the 'Museo Borbonico' are several representations of bronze candelabra found in Herculaneum and Pompeii.



[Small Candelabra, from the Townley Collection in the British Museum.]

CA'NDIA, the antient Creta, one of the largest islands in the Mediterranean sea, situated at the entrance of the Archipelago, and between the S.E. coast of the Morea, the Libyan or Barca coast, and the S.W. coast of Asia Minor. Its length from E. to W. is about 160 miles from Cape Salmone to Cape Crio: its breadth is very unequal. In some places, towards the middle of its length, it is about [illegible] miles broad, in others about 20, between Retimo and Sphakia 10, and in one place in the E. part of the island between the gulf of Mirabel and the coast of Hierapetra only 6. It has three principal capes: Samonium, now Salmone, at the E. extremity towards Rhodes, Corycum now C[illegible] Buso N.W. looking towards the Morea, and Crio S.W. looking towards the Cyrenaica. Its coast, especially towards the N., is indented by deep gulfs, of which those of [illegible], Khania, Suda, Armyro, and Mirabel, or Spinalonga, are the deepest, and the three principal towns of the island, Canea, or Khania, Retimo, and Candia are on that side. The S. coast is rugged and iron-bound. A continuous mass of high land runs through the whole length of the island, about the middle of which Mount Ida, now called Psiloriti, rises far above the rest, to the height of 7674 feet according to Sieber's observations. (*Orographie de l'Europe*). The mountains in the W. part of the island are called by Strabo Leuca Ore or white mountains; he says they are about as us (probably about 5000 feet). It is supposed the modern name of Candia (candida) is derived the white appearance of these mountains as seen from sea; but according to Scylitzes the Byzantine chronicler, the name of Chandes was given by the Saracens to the town, which they built, and which still bears that name, signifying in their language 'an entrenchment.' In the S.W. part of the island the mountains run close to the coast. This is the district of the Sphakiotes, a race of mountaineers, occasionally robbers and pirates, who have never been totally conquered by the Turks. The rivers of Candia are only a kind of torrents, very shallow in the dry season.

The antient history of Creta begins with the heroic or fa-). Historians and poets tell us of a king called lived before the Trojan war, and resided at the site of which is not far from the present town and ruled over the greater part of the island. He legislator of the country, and his laws became celebrated among the Greeks, who borrowed from them. (Strabo, x. p. 328.) He employed Dædalus, an Athenian artist, on his return from Egypt, to build a labyrinth in imitation of that of Mœris in Egypt; and he afterwards confined in it Dædalus himself. Minos, according to tradition, was also the first who had a navy: he cleared the Grecian seas of pirates; expelled the Carians from the Cyclades, and settled his sons in them. (Thucyd. i. 4.) Then comes the well-known story of the Minotaurus, Theseus and Ariadne. Idomeneus, a grandson of Minos, one of the Cretan chiefs who went to the siege of Troy, on his return was driven away by his subjects, and went to found the colony of Salentum on the coast of Iapygia. After the expulsion of the dynasty of Minos, Gortys, a town built in the centre of the island near the foot of Mount Ida, became a powerful rival to Cnossus. Creta had once many flourishing cities, some say a hundred: the principal, besides Cnossus and Gortys or Gortyna, were Cisamus, Cydonia now Canea, Amphimalla, Rithymna, now Retimo, Heracleum the port of Cnossus, and Miletus, all on the N. coast; Phalasarna on the W. coast; Lyctus, Phœnixportus, and Hierapetra on the S., and Ampelos on the E. coast. Strabo, whose maternal ancestors were from Cnossus, although he himself was born in Pontus, gives a pretty full account of the Cretans, their laws, their towns, and the wars between them; and Aristotle in his 'Politic' (book ii.) has described the peculiar institutions of the antient Cretans. The E. part of the island had been colonized by the Dorians, the W. part was inhabited by the Cydonians, and the S. by the Eteocretes. It was two days sail from the S. coast of Creta to Cyrenaica and four to Egypt.

The Cretans were often at war among themselves or with their neighbours the Cilicians, and with the kings of Syria and of Egypt. They materially assisted Demetrius II. Nicator to recover the throne of Syria, over the usurper Alexander Balas, 148 B.C. (Justin, xxxv. 2.) The Cretans were celebrated for their archery, and in the later period of their political history were often employed as mercenary troops by other nations.

Creta was conquered by the Romans, 67 B.C., under the proconsul Quintus Metellus, after an obstinate defence. It became a Roman province, and a colony was sent to Cnossum. The Cretans seem to have been notorious for dishonesty and lying. 'Cretizare cum Cretensibus' was a common proverb, meaning 'to deceive the deceiver.' St. Paul, in his epistle to Titus, whom he had appointed to preach the Gospel to the Cretans, alludes to the bad reputation of the people.

Creta remained subject to the Roman emperors, and afterwards to the Byzantines, till A.D. 823, when it was conquered by t[illegible]racens, who built the town of Candia, which has ever si[illegible]een considered the capital of the island. Nicephorus Phocas retook it in 961. After the taking of Constantinople by the Franks, Baldwin I. gave the island of Candia to Boniface, Marquis of Montferrat, who sold it to the Venetians in 1204. The Venetians kept possession of Candia more than four centuries; it was one of their chief possessions in the east, and the first of the three subject kingdoms (the other two were Cyprus and the Morea) whose flags waved over the square of St. Mark. The island was governed by a proveditor-general from Venice who had under him the four proveditors of Canea, Candia, Retimo, and Sitia. For judicial matters there were Rettori or judges sent also from Venice, each of whom was assisted by two co[illegible]s who were natives of the island. The muni- pal [illegible]ration was in the hands of the Candiotes. The taxes were very moderate. The native nobility enjoyed feudal privileges, and they were bound to have a certain number of militia from among their vassals and tenants ready when called. The whole of this militia was reckoned at 60,000 men. Although most of the natives were of the Greek church, and had their own clergy, there was an archbishop of the Latin or western church who was sent from Venice. In 1645 the Turks landed 50,000 men, besieged, and took Canea; in the following year they took Retimo, and in 1648 laid siege to Candia the capital of the island. This siege, the longest in modern history, lasted 20 years. The Venetians strained every nerve for the defence of the place. The order of Malta, the pope, the duke of Savoy, Louis XIV., all sent auxiliaries to the relief of Candia. The vizier Achmet Coprougli was at last sent, in 1667, by the sultan with great reinforcements to carry the place; Francesco Morosini conducted the defence. In September, 1669, the Venetians, having exhausted every means, surrendered Candia to the vizier by a convention in which they retained the forts of Suda, Spinalonga, and Carabusa, on the coast of the island. The wars of Candia cost the senate 25 millions of ducats. In the last three years of the siege 29,000 Christians and 70,000 Turks were killed. The Turks made 69 assaults, and the Venetians made 80 sorties: the number of mines exploded on both sides was 1364. (Daru, *Histoire de Venise*; Botta, *Storia d'Italia continuata da quella del Guicciardini*.)

The Turks divided the island, which they call Kirid, into three governments or pashalics, Canea, Retimo, and Candia. The sultan gave up the island of Candia about ten years since to Mehemet Ali, the pasha of Egypt, as a compensation for his expenses in the war against the Moreotes. It is now a pashalic dependent on the vizier of Egypt. Candia, the capital, is still a strong place, but much decayed compared with what it was under the Venetians, and its harbour is nearly filled up. The immediate governor of the island resides here, as well as the archbishop of Gortys, who is primate of Candia. Canea is the most frequented harbour in the island. Retimo has also a small port. On the S. coast are the small towns of Hierapetra and Sphakia. We have no authentic statement of the population of the island, although it has been stated at 300,000.

The soil of Candia is fertile, and produces wheat in abundance, good wine, oil, lemons and oranges, and all sorts of fruit. A quantity of honey and several kinds of gums are collected. The sugar cane and the palm-tree also thrive here. The ladanum, *cistus ladanifera*, is found in abundance, and is described in Tournefort's account of Candia, which though old is still one of the best. A great quantity of white soap is exported from Candia.

Although the island is nearly filled with mountains there are several extensive valleys or plains: that of Messaria, which is near the centre of the island near the site of the antient Gortys, is the most productive. The country about Retimo and the plain near Candia are also very fertile. In Walpole's collection of *Travels in various Countries of the East*, there is an account by Mr. Cockerell of an excursion from the town of Candia to a curious excavation in a mountain about three miles from Agio Deka, a village near the site of Gortys, and 20 miles inland from Candia, which the inhabitants call by the name of the labyrinth. It is a very intricate maze, cut through a freestone rock; many of the passages are very low and narrow, but the principal way is about eight feet wide, and as many in height. There are several square chambers at the ends of some of the passages, and piers have been left in the middle to support the superincumbent rock. Tournefort had visited this excavation. Mr. Cockerell has explored all the excavation that was accessible, of which he gives a plan; it is in its whole length, including the windings, about three-quarters of a mile, but this is evidently only part of the whole, as many of the passages are stopped up in consequence of the falling in of the rock. It has been said that this excavation may have been originally a quarry, and afterwards made into a maze for the purpose of concealment or confinement. Some have supposed this to have been the labyrinth of Minos, which however we are told was a building, and stood near Cnossus. The site of antient Gortys, which Tournefort describes as being in his time strewed with monuments and r vious said by Mr. Cockerell to contain only the ru arcation. face of a deep and some other inconsiderable remains. tories of Caloyers are scattered about the is uk. to be possessed of considerable landed pr

Turks, many of whom are sons of renegade Greeks, have the reputation of being among the most turbulent, fanatical, and quarrelsome among the Mussulman populations on the coasts of the Levant. The Candiote Greeks have not a much better name than their Mohammedan countrymen. The little island of Carabusa, well known in our times as a nest of pirates, lies at the N.W. extremity of the island.

(Strabo, lib. x.; Sieber, a German traveller, visited Candia in 1817, and published his *Reise nach Kreta* in 1823; Hoeck's *Kreta*, published about the same time, is the best authority for the antient history of the island.)

CANDLE — French, Chandelle; German, Lichter; Dutch, Kaarzen; Italian, Candela; Spanish, Velas; Portuguese, Velas; Russian, Swjetschi; Latin, Candela. Candles are commonly made of tallow, but superior kinds are made of bleached wax, or of the purified head-matter of the spermaceti whale, or of a composition of purified tallow and wax. Very recently the concrete matter from which the more fluid portion of the oil of cocoa-nuts has been separated by pressure has been used for making candles, and some manufacturers have separated the fatty from the oily substance of tallow, and have used the former alone, which is called *stearine*, for the purpose. The form of a candle is always cylindrical, and a fibrous and combustible substance called a wick always occupies the centre of the cylinder throughout its length.

The process by which light is produced from the combustion of a candle or a lamp is the same in both cases, with this difference, that the solid matter of the candle must be rendered fluid by the heat of the wick previous to its conversion by the continued application of heat into inflammable gas. In all cases the office of the wick is merely mechanical, serving in the first instance by the heat given out during its combustion to fuse that portion of the tallow or wax to which it is more nearly applied, and then to take up through its fibres the fluid matter, which is thus prepared by minute division for decomposition and combustion.

It is essential to the goodness of a candle that the size and substance of the wick should be adapted to the substance of the candle. If the wick be too thin, it will not be capable of absorbing the fused portion of the candle so fast as it is melted, and this unabsorbed portion will consequently run down the side of the candle and be wasted. If, on the other hand, the wick should be too large, perfect combustion will be impeded through the want of air in the middle of the wick, and the melted fatty substance being less completely decomposed will pass off unignited in the form of smoke: in this case too the light will be partially impeded by the body of the wick. Candles made of wax and of other matters which fuse less easily than tallow consequently burn longer than tallow candles, and yield a purer and steadier light. The less fusible matter requires a smaller wick to act as its carrier and to place it in circumstances favourable for combustion, and this smaller wick being less capable than the more substantial wick of a tallow candle of supporting its own weight, the extremity falls out of the perpendicular, and being brought into contact with the oxygen of the atmosphere is consumed: the wick of a wax candle consequently requires no snuffing as that of a tallow candle does, in order to ensure the brilliancy of its flame, neither does it occupy so large a space in the centre of the flame, and so intercept the rays of light given off during the combustion.

Various plans have been proposed to obviate the inconvenience of snuffing tallow candles. One of the most ingenious of them was the subject of a patent in 1799. This plan consisted in making the candle a solid cylinder throughout without any wick in the centre, and applying on the top of the candle a very short wick which acted in the same manner as the short wick of a lamp. Two different methods were employed for keeping this wick in contact with the top of the candle during its combustion. One was to attach the wick to a small metallic frame or ring which was placed round the top of the candle like a collar, and was of such a size as to admit of its moving freely on the candle, so that it sunk in proportion as the matter of the candle was consumed. A cross piece, in the centre of which a socket was made for the insertion of the wick, kept the latter in its proper position, and prevented the undue sinking of the

The other method was that of attaching the wick

It appears ble vertical rod which formed part of the

as an altar. of keeping the top of the candle in contact

aramonti, vol. lacing its lower end upon a spiral spring which constantly pressed the candle upward against the frame that contained the wick. It is probable that one principal cause of the failure of these contrivances arose from the nature of the substance of which the candles were made; the unconsumed carbonaceous matter would form a crust upon the wick which would occupy in part the place of the flame, and thus to a considerable degree cause the same inconvenience as the ordinary wick.

There are two ways of making candles, which are distinguished as *dipped* or *mould* candles according to the method employed. Dipped candles are made as follows — Wicks made of spun cotton are selected of a size proper for the intended diameter of the candle, and are cut into the requisite lengths by a simple and convenient machine, being first doubled and twisted so as to leave a loop [illegible] end. Into this loop a smooth cylindrical stick half [illegible] in diameter and about three feet long is inserted, and several of the cottons or wicks, being so treated and dipped at regular intervals on the stick, are ready to receive their external coating of tallow. The number of cottons ranged upon each stick varies according to the size of the candles to be made, it being usual to place such a number as, when the requisite quantity of tallow has been attached, will weigh two pounds: *e. g.* if candles eight of which will weigh a pound are to be made, 16 wicks are ranged upon each stick; if six are to make a pound, then 12 wicks are used, and so on. The tallow, being previously melted and strained, is placed in a kind of trough, into which the wicks are dipped three times for the first 'lay;' after being kept a short time over the trough for the wicks to drain, the sticks are placed on a rack from which the candles hang freely, and are thus allowed to harden. The same process is repeated a second and a third time and oftener, according to the required weight of the candles. Where large quantities are to be made, several sticks are placed together in a kind of frame, and are lowered into the melted tallow and raised again by machinery, a counter-weight being used in order to indicate when the wicks have taken up the required quantity of tallow.

During the operation the tallow in the trough must be stirred from time to time and fresh tallow supplied, the whole being kept in a proper state of fluidity by the external application of a brazier or a bath of hot water.

Mould candles are made in cylindrical moulds of pewter, one end of which is smaller than the other to allow of the easy removal of the candles. From 10 to 16 of these moulds are placed together in a wooden frame, so that their larger ends terminate in a kind of trough common to the whole the wicks are inserted and kept firmly in their proper places in the centre of each cylinder by strong wires. The frame being then placed with the trough uppermost, the moulds are filled with melted tallow and are placed in the air to cool, after which the wires by which the wicks are fixed are withdrawn, the superfluous tallow is removed from the trough, and the candles are pulled out of the moulds.

The process used in making wax candles is different. The wicks being cut and twisted in the manner above described, a set of them is suspended over a basin of melted wax, which is taken up by a large ladle and poured from time to time on the tops of the wicks, and the melted wax running downwards adheres to and covers the wicks throughout their length. This is repeated until a sufficient weight of wax has been gathered upon each. After the candles are sufficiently cooled they are rolled upon a smooth table in order to give them a perfectly cylindrical form, and are then polished.

For a long time tallow candles were subject to an excise duty of one penny, and those made of wax and spermaceti of threepence halfpenny per pound. This duty was repealed from the 1st of January, 1832. During the last five years of its continuance, excluding 1831 when the manufacture of candles was checked in anticipation of the ceasing of the duty, the quantities of tallow and of wax and spermaceti candles respectively which were made in this kingdom were as under:—

	Tallow.	Wax and Spermaceti.	Net produce of Duty.
	lbs.	lbs.	£
1826	110,102,643	907,405	467,101
1827	114,939,578	932,932	437,308
1828	117,342,157	1,018,556	497,953
1829	115,556,802	1,049,735	490,750
1830	115,586,192	1,265,113	489,413

The statements of the custom-house as regards exports include together soap and candles, so that it is not possible to ascertain what proportion of the above quantities have been consumed within the kingdom.'

CANDLEBERRY-TREE. [MYRICA.]

CANDLEMAS, the popular name for the Feast of the Purification of the Virgin Mary, February 2nd, derived from the lights which were then distributed and carried about in procession. These lights, it should seem, were carried more immediately in allusion to the prophetic words of Simeon, who, speaking of the infant Saviour, presented in the temple at the same time, said he was 'a light to lighten the gentiles.' Alcuin, *De divinis Officiis*, p. 231, says, the candles at the purification were an exchange for the lustration of the pagans. From this ceremony of purification the present religious ceremony of the churching of women after child-birth arose.

The Doctrine of the Masse Booke, &c., from Wyttonburge, by Nicholas Dorcaster, 8vo., 1554, preserves the prayer for 'the hallowing of candles upon Candlemas Day.' The candles, having been sprinkled with holy water, were lighted and distributed. They were considered to possess a virtue sufficiently powerful to frighten away devils, and to be a charm against thunder and lightning. Stowe, in his *Annals*, fol., 1631, p. 595, says, 'On the 2nd of February, 1547-8, being the Feast of the Purification of our Lady, commonly called Candlemasse Day, the bearing of candles was left off throughout the whole city of London.'

'There is a general tradition,' says Sir Thomas Browne, 'in most parts of Europe, that inferreth the coldness of succeeding winter from the shining of the sun on Candlemas day, according to the proverbial distich—

> '"Si Sol splendescat Mariâ purificante,
> Major erit glacies post festum quam fuit ante"'

A French Almanac of 1672 says—

> Selon les anciens se dit,
> Si le soleil clairment luit
> A la Chandeleur, vous verrez
> Qu'encore un hyver vous aurez:
> Pourtant gardez bien vostre foin,
> Car il vous sera de besoin:
> Par cette reigle se gouverne
> L'ours, qui retourne en sa caverne.'

Candlemas Day was also called Christ's Presentation, the Holiday of St. Simeon, and, in the North of England, the Wives' Feast Day. (See Brand's *Popular Antiquities*, 4to. edit., vol. i., p. 38; Brady's *Clavis Calendaria*, 8vo., London, 1812, vol. i. p. 184; Sir T. Browne's *Vulgar Errors*, fol., 1646, p. 289.)

CANDY, the Maha Neura, or great city of the Cingalese, and the capital of the king of Candy's dominions, is situated in the Rattie, or county of Yatineura, in 7° 17′ N. lat., and 80° 36′ E. long.

The city stands in the midst of steep and lofty hills covered with jungle, at the head of an extensive valley, and about 1467 feet above the level of the sea. It is surrounded by a mud wall, but its principal defence from hostile attacks consists in thick thorn hedges, which are drawn round the hills like lines of circumvallation, leaving only narrow passes, which are guarded. The city is also nearly surrounded at the distance of three miles by the river Mahavilly Ganga, which is crossed at a ferry where the river is rocky and rapid; a strict guard is kept at this ferry.

The principal street is on the declivity of a hill, and is nearly two miles long, but built in a very straggling manner. The houses are of mud, and only one story high, standing on foundations raised about five feet above the level of the street. The houses of the chiefs are tiled and white-washed, the others are thatched. The palace covers a considerable space, and contains a great number of rooms, the walls of which are grotesquely painted. In one room is a colossal brass figure of Buddha, with two smaller figures at his feet.

In the beginning of 1803 a British force entered the Candian territory, and on the 20th of February arrived before Candy; when the king and his chief officers withdrew, after setting fire to the palace and other principal buildings. In the following June, when the English garrison were in a sickly state, they were attacked by a considerable native force and obliged to capitulate, on condition of being allowed to quit the city unmolested, with arms and ammunition, and that proper care should be taken of the sick. Scarcely however had the English troops quitted Candy when the latter part of the stipulation was treacherously broken, and the sick persons were murdered.

The total population of Candy was estimated in 1819 to amount to no more than 3000 souls. The climate is comparatively cool, the mean temperature for the year being about 74° Fahrenheit. This city is about 65 miles direct distance, E.N.E. from Columbo, and 95 miles S.S.W. from Trincomalee.

CANDY-TUFT. [IBERIS.]

CANE. [CALAMUS.]

CANEA, or **CANNA**, one of the three sandshaks or circles of the Turkish ejalet of Kirid, which consists of the island of Candia. It occupies the western district of that island, and on its northern shores lies a promontory, terminating in Cape Melek, and forming the Bay of Suda. The declivities of the Sphachio mountains, which form its southern borders, are stony and naked, and the mountains themselves are covered with snow for four or five months in the year; the adjacent parts, however, afford excellent pastures, where large herds and flocks are reared. The lowlands near the coast produce grain and oleaginous seeds, cotton, flax, honey, wax, and some fruit. Canea, the capital of the sandshak, and the residence of the bey and of a Greek bishop, is surrounded by strong walls and deep ditches, both of which are in a state of great dilapidation; it is situated on the northern coast, and contains a small fort with a lighthouse, several mosques and Greek churches, a Capuchin monastery, and about 9000 inhabitants, of whom 2000 are Turks and 300 Jews. The harbour, by neglect in cleansing, has become so shallow that only vessels of small burthen can enter. It is the principal mart for Candian commerce, and carries on much trade with France, Trieste, Venice, &c., in wax, soap, oil, and other products of the island. A number of French merchants have established themselves here. There are some vaulted basins for the docking of ships, and several store-houses along the sides of the harbour. The environs are pleasant; thick woods of olives are interspersed with corn-fields, gardens, and vineyards, and a number of rivulets, shaded with roses and myrtles, wind through them. Canea is the site of the antient Cydonia, and fell under Ottoman dominion in 1645. At the present time (1836) this town, as well as the whole island, is occupied by the Pasha of Egypt. 35° 28′ N. lat., 24° 2′ E. long.

CANELLA ALBA, a tree growing on the coast of many of the West India Islands, particularly Jamaica, also on stony hills; and in woods of the mainland of South America. It was called by Linnæus at one time Laurus Winteranus, (*Spec.* ed. i. p. 371,) and at another, Winteriana Canella, (Lin. *Sp.* 636.) By some it is referred to the Meliaceæ, by others to Guttiferæ. The bark of the young branches of this tree, freed from its outer rind, is the canella alba of the shops (called also costus dulcis and costus corticosus, and cortex Winteranus spurius, or false Winter's bark). Owing to its white appearance, it has received the name of white cinnamon, which it also resembles in smell as well as cloves. The whole tree is very aromatic, and when in flower perfumes all the neighbourhood; even the dried flowers, when softened again in warm water, have a fragrant odour similar to that of musk. The smell of the leaves resembles that of laurel. The bark is brought to Europe in rolls or quills of two or three feet long, or short broken pieces of from ⅓ to 1¼ inch in diameter, and ½ to 1½ line in thickness. The outer surface is either reddish-yellow or verging to a whitish-yellow; the inner surface smooth, resembling the external in colour. The taste is at first agreeably aromatic, and somewhat bitter; afterwards acrid and peppery.

According to Petroz and Robinet, it contains a very acrid aromatic volatile oil (which Sloane says is heavier than water, Henry lighter, and which is employed for the adulteration of oil of cloves), a bitter extractive, a resin, a sort of manna sugar, called *canellin*, gum, albumen, and starch. It is rarely, if ever, adulterated, but is itself often substituted for the Drymis Winteri or true Winter's bark. The two may be distinguished by the following characters:

Canella Alba.	*Winter's Bark.*
Of a pale orange or ash colour.	Grey or reddish-grey.
Fracture whitish, marbled.	Fracture compact or foliaceous, grey at the circumference, red towards the centre, with a very obvious line of demarcation.
Internal surface covered with a whitish pellicle.	Internal surface of a deep red or black,

Canella Alba.	*Winter's Bark.*
Odour agreeable, resembling cloves.	Odour peppery, and, when powdered, turpentine-like.
Taste acrid, bitterish.	Taste sharp, burning, intolerable.
Powder white.	Powder greyish yellow.
Watery infusion pale.	Watery infusion red.

The cold infusion of each, treated with the following reagents, conduct themselves thus:

	Tincture of Galls.	*Muriate of Iron.*
Canella Alba.	Slight whitish disturbance.	Brown yellow discoloration.
Drymis Winteri.	No action.	Dark brown discoloration.

	Sulphate of Iron.	*Nitrate of Barytes.*
Canella Alba.	No action.	No action.
Drymis Winteri.	Precipitate.	Precipitate.

Alcohol is the most appropriate menstruum: water takes up the less powerful principles only. As the infusion is not affected by many articles which it is often desirable to give at the same time, it affords an eligible vehicle for these, such as tincture and infusion of galls, lime-water, tartar emetic, and the salts of iron and mercury. It may also be given in powder. From its aromatic properties, it is likewise a suitable adjunct to mere bitter infusions, such as those of gentian. In the dyspepsia, attended with constipation, of sedentary people, along with sulphate of iron, aloes, and sulphate of potass, it is a most efficacious medicine.

CANES VENATICI, the Hounds, a constellation added by Hevelius, who called the nearest to the pole Asterion, and the other Chara. They are held in a string by Bootes, and are surrounded by Bootes, Coma Berenices, and Ursa Major. (See also COR CAROLI.)

Character.	No. in Catalogue of		Magnitude.
	Flamsteed.	Astron Society.	
d	8	1449	4½
a	12	1492	2½
f	14	1503	5
h	20	1525	6
	21	1526	6

CANG or **KEA**, a large wooden collar used as an instrument of legal punishment by the Chinese. It is a species of walking pillory, fitting close round the neck of the culprit, and of such a weight that he can carry it, though with pain and difficulty. The weight is proportioned to the nature of the offence; but the cang most commonly in use weighs from 50 to 60 pounds. When it is fastened round the neck, two long slips of paper are pasted over the two parts of the cang, which opens and shuts like our stocks; on these papers the mandarin puts his seal, so that the parts cannot be separated or the criminal relieved without its being perceived. The crime for which he suffers and the duration of his punishment are then inscribed on the cang in large letters, and the officers of the police parade the criminal through the town, after which he is left exposed in some much frequented street or square, or at one of the gates of the city. As the cang prevents his making any use of his hands, he must be fed by others. A recent writer, who has lived long in China, says that this awkward, galling, torturing wooden collar, which is removed neither by night nor by day, is sometimes worn for a whole month (*The Chinese*, by John Francis Davis, Esq.), and, according to older authorities, or the Jesuit missionaries, it was not unfrequently worn for three months together. The Chinese consider this species of punishment very infamous and degrading. A correct representation of the instrument and the manner in which it is applied are given in Sir George Staunton's account of the Chinese, and in the work of Mr. Davis. The cang, called by them Tahtakulah, was formerly in use among the Turks. [BASTINADO.]

CANGE, CHARLES DUFRESNE SEIGNEUR DU, was born at Amiens in 1610. He studied the law, but after a time gave himself up entirely to history and philosophy. His first work was 'Histoire de l'Empire de Constantinople sous les Empereurs François,' fol., 1657. But he is better [illegible] for his 'Glossarium ad Scriptores mediæ et infimæ [illegible]tis,' 3 vols. fol.; afterwards republished in 6 vols. in 1733, to which were added 4 more vols. by Carpentier, a Benedictine of the order of Cluni. It is a most useful work for the understanding of the numerous writers of the dark or middle ages, when for many centuries a corrupt and barbarous Latin was the literary language of Europe. All the words used by [illegible] writers, which are not found in classical latin[illegible] [illegible]d in alphabetical order, with their various meanings, their etymology, and references to the authorities. This work is also useful for understanding old charters, and other legal documents of an early date. The labour and research required for the compilation of such a work can be best appreciated by those who have frequent occasion to consult it. Ducange was one of the editors of the 'Corpus Historiæ Byzantinæ.' He died in 1688. Louis XIV. bestowed a pension of 2000 francs [illegible] his children. [BYZANTINE HISTORIANS.] He [illegible] also: 1. 'Historia Byzantina illustrata,' fol., 1680, being an historical description of Constantinople and its monuments, with biographies and genealogies of several distinguished families of that city. 2. 'Glossarium ad Scriptores mediæ et infimæ Græcitatis,' Paris, 1688, 2 vols. in fol., a work that is very necessary for those who are studying the lower Byzantine writers. He left a vast quantity of MSS., especially on historical, archæological, and genealogical subjects, which have been collected in the national or royal library at Paris, and of which an account is given in the *Mémoire historique sur les MSS. de M. du Cange*, Paris, 1752. Ducange is often quoted by the name of Du Fresne, under which he is also registered in many catalogues.

CANIS. [DOG.]

CANIS MAJOR, the Greater Dog, a constellation which contains SIRIUS, the brightest star in the heavens, called also the Dog Star. To this article we shall refer all historical and mythological information connected with this constellation, it being in fact the star, and not the constellation, about which we shall have to speak.

This constellation is directly found by the bright star Sirius, which is in the continuation of the line drawn through the belt of Orion. The surrounding constellations are Argo, Monoceros, Orion, Lepus, and Columba Noachi. At the end of January, Sirius is on the meridian at midnight. The letters in parentheses are not Bayer's (Baily's *Flamsteed*.)

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi ().	Astron. Society.			Flamsteed, Piazzi ().	Astron. Society.	
ζ	1	791	3	γ	23	878	3
β	2	797	2	o^2	24	877	4½
λ	3	798	4	δ	25	883	2½
ξ^1	4	818	5		26	890	7
ξ^2	5	821	5	(e^1)	27	894	7
ν^1	6	...	5	(ι^2)	28	896	3½
ν^2	7	823	5		29	904	5
ν^3	8	824	5	(*d*)	30	905	6
α	9	838	1	η	31	915	2½
(ψ^2)	11	841	5		(13)	886	[illegible]
κ^2	13	848	5		(17)	773	[illegible]
θ	14	854	5		(59)	[illegible]	[illegible]
(π^1)	15	853	6		(88)	910	[illegible]
o^1	16	857	5	(D^1)	(136)	[illegible]	[illegible]
(π^2)	17	858	6	(C)	(118)	[illegible]	[illegible]
μ	18	862	4		(151)	816	[illegible]
(π^3)	19	860	6		(267)	849	5
ι	20	863	4		(300)	867	6
ε	21	869	2½		(303)	868	[illegible]
(σ)	22	875	4				

CANIS MINOR, the Lesser Dog, a cons[illegible] above the Greater Dog, and distinguished by a star of the first magnitude, PROCYON, which see for information connected with the history of this constellation. It may be found in the heavens thus: draw a line through Orion's belt and Sirius; a perpendicular to this line from Sirius upwards will pass through Procyon, which is too large a star to be mistaken. It is also nearly in the line joining Sirius and Pollux, about midway between them. The letters in parent

Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi ( ).	Astron. Society.	
	1	912	6½
ε	2	913	6
β	3	917	3
γ	4	921	6
η	5	920	6
(σ)	6	923	6
δ¹	7	925	6
δ²	8	930	6
δ³	9	932	6
α	10	941	1½
(π)	11	953	6
ζ	13	962	5
	14	973	6
	(249)	968	6

ER. This term is applied, perhaps not with strict propriety, to a very serious disease of the foot of the horse. The horn having been separated from the sensible portion of the foot, a fungous substance is produced instead of new and healthy horn. The treatment, however, is exceedingly simple. Every portion of horn that has begun to detach itself must be removed. Some superficial caustic must then be applied in sufficient quantity to repress the growth of the fungus, and to rouse the exposed surface to healthy action, but not to eat into and corrode the foot. The butyr (protochloride) of antimony is the best agent for accomplishing those purposes; for, being speedily decomposed by the moisture of the part, it can only act as a superficial caustic. The fungus having been repressed, the Friar's Balsam may succeed as a mild stimulant to the secretion of good horn. No ointment should touch the cankered foot; but pledgets of soft and clean tow should be placed over the sore, and bound firmly upon it, making as equable a pressure on every part of it as can possibly be effected. The foot should be dressed at least once in every day, and kept as dry as circumstances will allow.

Inflammation of the internal part of the ear of the dog will sometimes produce a fungous ulceration, to which also the term *canker* has been applied. A dog may be observed to be continually shaking his head, or scratching his ear, or carrying his head on one side. If the part is examined, some degree of redness or enlargement of the irregular projections on the inside of the ear will be seen. This will generally yield to a few washings with warm soap and water; but should actual ulceration have commenced, a drachm of the extract of lead should be added to half a pint of a decoction of the heads of white poppies, and this substituted for the soap and water. The inflammation beginning to subside, a scruple of alum should be added to this lotion, in order to dry up the ulcer; but nothing stronger than this should ever be applied, and even the alum should be cautiously added, in proportion as the dog is able to bear it. Purging and alterative medicines will be useful auxiliaries.

If the case is obstinate, and the ear begins to be extensively ulcerated, and the ulcer spreads over the flap of the ear, a seton should be inserted in the poll precisely between the ears, and extending from ear to ear. All water-dogs are particularly liable to this species of canker.

There is another variety of canker belonging to the flap of the ear, to which the hound and the pointer are especially subject. It is either the consequence of that which has been just described, or exists independently of it. A sore appears on the edge of the flap of the ear of a true cankerous nature, and corrodes the very cartilage. The treatment of this also is simple and effectual. The ears, or at least the diseased ear, must be confined by a cap of leather or strong calico, for while the dog can flap and beat his ear, it is evident that the sore can never heal. This being contrived, a strong ointment of alum or white vitriol (sulphate of zinc), or both combined, should be well rubbed on the sore morning and night. The simple alum ointment should first be tried.

Sportsmen too often *round* the ears of the dog; that is, they cut off the diseased parts. This disfigures the animal, and is rarely effectual. Either a new ulcerative inflammation is set up by the operation, or the whole ear having been inoculated and empoisoned [illegible] from the old wound, the peculiar ulcer of canker speedily appears again as extensive and as obstinate as before.

CANNA. [Antelope, Species 57, 58.]

CA'NNABIS (in Greek Κάνναβις, and in Latin also the same, Cannabis), the genus of plants that yields the substance called hemp. *Cannabis sativa*, or common hemp, is a plant nearly allied botanically to the nettle, with which it even agrees in its general appearance. It is an annual diœcious plant, with erect nearly simple stems from four to six feet high, and covered with rigid hairs. The leaves are either alternate or opposite, digitate, and stalked; the leaflets are five in number, narrow, lanceolate, sharp-pointed, serrated, rough, pale-green on the under side; the uppermost leaves have only three leaflets. The male flowers grow in little bunches at the axils of the upper leaves; they are pendulous from short stalks, and have a calyx of five spreading, narrow lanceolate sepals containing five stamens. The female flowers appear in close, leafy clusters at the axils of the upper leaves, and consist of a roundish calyx split half-way down into two parts, and containing a simple one-celled ovary terminated by a couple of awl-shaped stigmas. The fruit is a lenticular body, looking like and commonly called a seed.

This is the only species known; it is said to be a native of Persia, and is certainly wild, according to Roxburgh, 'among the hills and mountains north of India, as well as common everywhere in the gardens of the natives throughout Asia.' It is now universally distributed over the north of Europe. Herodotus, iv. 74, describes it as growing in Scythia, N. of the Danube, a country which he had visited. We must from this conclude that the plant is really a native of north and east Europe.

It is from its possessing a remarkably tough kind of woody tissue capable of being manufactured into linen and cordage, that hemp is best known; and for its good qualities in this respect it is unrivalled among the many species possessing similar properties in the nettle tribe [Urticaceæ]. But it also contains a deleterious narcotic secretion of great energy. If one remains for any length of time amongst a plantation of young hemp, head-ache and vertigo are often the result; in hotter countries these effects are much more violent, a kind of intoxication being speedily produced. Oriental nations have taken advantage of this to add another to the list of intoxicating drugs, which they contrive to substitute for the forbidden wine of western people. The powdered leaves, mixed with some kind of aromatic, are infused in water, and drunk, when a drowsy ecstatic feeling comes on, which is said to be much more agreeable than that produced by opium. The leaves are also mixed with tobacco for smoking. The two chapters of Herod. iv. 74, 75, are curious, as to its intoxicating effects, &c. The drug obtained from hemp is called bang, or haschish, or cherris: gangika, or ganga, kinnab, subjah, majah, are other names for it. The seeds of hemp abound in a thick mucilage, and are used medicinally for the preparation of emulsions; a useful oil is obtained from them by pressure.

CANNÆ. [Hannibal.]

CA'NNÆ. [Marantaceæ.]

CANNES, a town in France, in the department of Var, on the coast between Frejus and Antibes; 24 miles from Frejus, and about 10 from Antibes. Of the houses, some are built in a line along the shore, having the space which separates them from the sea planted and laid out as a promenade; those in the back part of the town are clustered on the tolerably steep slope of a hill, which is surmounted by an antient castle, no longer used as a place of defence. The only defence of the town consists in a battery, the guns of which bear upon the sea. Cannes has neither harbour nor roadstead; but only a small bay or cove so shallow that the coasting vessels that use it are obliged to anchor at some distance from the shore, exposed to the full action of the swell. Yet with this disadvantage, Cannes is for its size a populous and busy town. Its commerce is in the anchovies and sardinies caught by the fishermen of the town (of these fish the town's people sell on an average 2000 quintals (100 lbs. each) per year), and in the wine, oil, oranges, lemons, figs, &c. produced in the neighbouring districts. Cannes is one of the places of France where the culture of the lemon is most successful. Population, in 1832, 3720 for the town, or 3994 for the whole commune. Expilly (A.D. 1762) computed the population at 5000.

Opposite the headland which forms the eastern bou of the gulf of Napoule, on which Cannes is situated, i the Isles of Ste. Marguerite (in the castle of which, used as a state prison, the prisoner with the iron mask was confined) and St. Honorat.

Napoléon [illegible] Cannes on his return from Elba to France in 1815.

CANNIBALS, *Anthropóphagi*, or men-eaters. In the Odyssey of Homer we have the story of Polyphemus devouring human flesh; and in Herodotus, the Massagetæ (i. 216) are said to eat their aged parents. The Padæi of India (Herod. iii. 99) were in the habit of killing and eating their relations when they fell ill; a story which some would reject with as little show of reason as others would believe it. Modern facts, the truth of which is put beyond all doubt, confirm the statements of Herodotus. Among the antient Tupís of Brazil, when the Pajé (chief) despaired of a sick man's recovery, he was by his advice put to death and devoured. (Dr. Martius in *London Geog. Journal*, ii. 199.) [See also Battas.] Herodotus (iv. 26) also says that among the Issedones, when a man's father dies, his relations come and help to eat the dead man, whose flesh they render more palatable by mixing it with that of some animal. That these facts as to cannibalism, as reported by antient writers, are not to be hastily rejected, need hardly be remarked.

In the middle ages, it is true, these stories of cannibalism were wonderfully enlarged, and people who had not yet embraced Christianity were pretty generally set down as anthropophagi. When the Lombards invaded Italy at the end of the sixth century, it was reported of them that they ate human flesh; and a century later the same aspersions were cast on the Sclavonian tribes. It became the fashion to bandy the accusation between enemies; thus, during the Crusades, the Saracens said the Christians ate human flesh, as well as the unclean flesh of swine, while the Christians on their side maintained that the Saracens ate men, women, and children, and were particularly fond of a sucking Christian babe torn fresh from the breast of its mother. The giants and ogres of our nursery tales are only the Saracens of the holy wars seen through the magnifying glasses of tradition and romance.

It [illegible] not much surprise us that in those rude ages men should [illegible] to fix a revolting practice on their sworn foes, but we [illegible] hardly understand why the minstrels of the Christians should convert their most approved heroes into cannibals, and praise them for the quantity of infidel flesh they devoured. Yet our Richard I. is put in this predicament by the author or authors of the romance of 'Richard Cœur de Lion.' According to the poem, the first symptom of the king's recovery from a dangerous sickness at Acre was a violent longing for pork, and as pork was difficult to procure in a Mohammedan country, his cook dressed him a Turk's [illegible] of which Richard ate with good appetite, and felt [illegible] quite well in consequence. After some more repasts [illegible] same kind, he is made to say:—

> 'King Richard shall warrant,
> There is no flesh so nourissant
> Unto an English man,
> Partridge, plover, heron, ne swan,
> Cow ne ox, sheep ne swine,
> As the head of a Sarezyne.'

The old travellers abound in stories of cannibalism, which we may almost invariably pronounce to be false. Few persons would now credit that the Indians and Chinese sold human flesh in the market, or that the Grand Khan of Tartary fattened his astronomers and magicians with the carcases of condemned criminals; but Marco Polo, the Venetian, who resided in China and traversed the Indian seas in the 13th century, in speaking of a people in Sumatra (the Battas), and of the fierce inhabitants of the group of islands called the Andamans, relates no more than has been confirmed by modern travellers.

In the 16th and 17th centuries, the wildest accounts of the natives of the newly found lands in America, and of places on the African coast recently brought within the range of European commerce, were circulated by ignorant sailors and believed by credulous writers. In many of these cases there was a small matter of truth at the bottom, which was wonderfully magnified by fear and credulity. It was reported, for example, that the Caribbees preferred sucking infants to all other food—that the Peruvians kept mistresses for the purpose of breeding children for their tables, and fattened, killed, and ate these women when they were past child-bearing—and, not to mention numerous other instances, that the Anzigas of South Africa exposed human flesh for sale in their shambles, as we do beef and mutton. The industrious old compiler Purchas says he was assured of [illegible] fact 'by John Battell, of Essex, a [illegible] of mine, and a man worthy of credit.' Even in modern times the inhabitants of Van Diemen's Land have been [illegible] cannibals, in Dentrecasteaux's Voyage, because [illegible] of a kangaroo were mistaken for those of a young [illegible].

Many persons, who admit that human flesh has been eaten under the pressure of necessity, as in sieges, shipwrecks, &c., still maintain that there is no evidence of any race or people eating human flesh from choice. But proof the most conclusive has been brought against the New Zealanders, who devour their captives taken in war in the most open manner. It is also stated on [illegible] authority that even the New Zealanders who had been [illegible] by intercourse with Europeans and their voyages [illegible] European ships resumed their habits of man-eating [illegible] as they returned home. That the horrid practice [illegible] on the decline in New Zealand is prov[illegible] captain in the French navy, who very recently staid [illegible] months at the island. (See *Voyage de la Favorite, de l'année* 1830 *à* 1833, par M. Laplace.)

The Battas of Sumatra have already been instanced as undoubted cannibals, and there are still native tribes in Guiana, in South America, who fatten and eat their prisoners (*London Geog. Journal*, vol. ii. p. 70; but compare vol. ii. p. 240.)

We refrain from offering any conjecture as to the origin of cannibalism. No explanation that we have [illegible] appears to us satisfactory.

(*History of Sumatra*, by William Marsden, F.R.S., p. 300; *Memoir of the Life and public Services of Sir T. Stamford Raffles*, by his Widow, vol. ii., p. 77; Volume on the *New Zealanders*, in *the Library of Entertaining Knowledge*.)

CANNING, GEORGE, was born on the 11th of April, 1770, in the parish of Marylebone, London. His descent on the paternal side was from an ancient family, his ancestors having figured at different periods at Bristol, in Warwickshire, and in Ireland.

Canning's father died in 1771, when his son was only a year old. His mother, who was afterwards twice married, lived to see her son occupy a high post in the government. The means of defraying Canning's education were furnished by his paternal uncle, a merchant in the city of London; but some slight funds are said to have proceeded from a small estate in Ireland which fell to him. George Canning was first sent to Hyde Abbey school, near Winchester, whence he was removed to Eton. He had begun to write English verses when very young, and at Eton, in his sixteenth year, he formed the plan of a periodical work called 'The Microcosm,' which was written by himself and three schoolfellows, and published at Windsor in weekly numbers from November, 1786, to August, 1787. In October, 1787, Mr. Canning was entered as a student of Christ Church, Oxford, where he gained some academical honours by his Latin poetry, and cultivated that talent for oratory which he had begun to display at Eton. At Oxford Mr. Canning made the acquaintance of Mr. Jenkinson, afterwards Earl of Liverpool, who is supposed to have been of service to him in the political career on which Mr. Canning entered immediately after leaving college. His college vacations were chiefly passed in the house of Mr. Sheridan, who took a lively interest in his fortunes, and introduced him to Burke, Fox, Lord John Townsend, the Duchess of Devonshire, and other leading persons, who were almost exclusively of the Whig party in politics. It has generally been stated that it was by the advice of Sheridan that Mr. Canning, who had entered of Lincoln's Inn, gave up the study of the law, and devoted himself to a political career. From his intimate connexion with Sheridan it was expected that he [illegible] adopted that gentleman's political opinions and [illegible] the opposition; but Mr. Canning accepted the [illegible] the Tory party, and was brought into parliament [illegible] Pitt in 1793. One of the biographers of Mr. [illegible] without pretending to determine the point, offers, as an hypothesis, to account for Mr. Canning's [illegible] at he might have seen 'the difficulties which e[illegible] us like his would experience in rising to the full growt[illegible] f its ambition under the shadowy branches of the Whig aristocracy, and that superseding influence of birth and connexions which had contributed to keep such men as Burke and Sheridan out of the cabinet.' (Moore's *Life of Sheridan*.) Mr. Can-ni[illegible] first care was to [illegible]nself [illegible]uaint the [illegible] de[illegible] sa[illegible] nt[illegible] dress[illegible]ated the style and manner o[illegible] powers as commanded respect and ge[illegible]he subject of the debate on which he spoke [illegible] treaty (coupled with a subsidy from England) with the [illegible] Sardinia to enable his majesty to resist the invasion o[illegible]mont by the French. During that session and the session of 1795 Mr. Canning spoke frequently, and at times was left by Mr. Pitt to bear the brunt of a formidable debate. At this time he supported the temporary suspension of the Habeas Corpus, [illegible] declared himself against parliamentary reform.

In 179[illegible] Mr. Canning became under secretary of state, and [illegible] general election in that year he was returned for the treasury borough of Wendover, Bucks. For two years his attention [illegible] chiefly confined to the duties of his office. In 1798 he ex[illegible] himself in favour of Mr. Wilberforce's motion for the abolition of the slave-trade, and in a speech which produced a very considerable effect in the house, he replied to Mr. Tierney's motion for recommending George III. to make peace with the French republic, then in the full career of conquest and spoliation. In the autumn of 1797 Mr. Canning, in conjunction with Mr. John Hookham Frere, Mr. Jenkinson, Mr. George Ellis, Lord Clare, Lord Mornington (now Marquis of Wellesley), and one or two oth[illegible] and political friends, started a paper styled 'The Anti-Jacobin,' the object of which was to attack the journalists and other writers of the day who advocated or were supposed to advocate the doctrines of the French revolution.

Mr. Gifford was appointed editor of this weekly paper, but Mr. Canning wrote the prospectus, and from its commencement, in November, 1797, to its close in 1798, he contributed largely to it. Some of the best of the poetry, burlesques, and *jeux d'esprit* were from his pen. (*Poetry of the Anti-Jacobin*, 1 vol. 8vo.)

When the subject of the Irish union was brought before parliament Mr. Canning repeatedly spoke at great length and with much effect in support of that measure. In 1799 he was appointed one of the commissioners for managing the affairs of India; and in 1800 he married Joanna, the youngest daughter of general John Scott, of Balcomie, an officer who had acquired great wealth. This union made Mr. Canning perfectly independent of place, for his wife's fortune exceeded 100,000*l.* On the dissolution of Mr. Pitt's cabinet in 1801, Mr. Canning retired with the rest, and for several successive sessions his declamation, wit, and keenness of irony, lent a formidable strength to the opposition arrayed against the Addington administration. On Mr. Pitt's return to office, in 1804, Mr. Canning was named treasurer of the navy.

In 1805 he defended Lord Melville, the ex First Lord of the Admiralty, who was accused by Mr. Whitbread and others of having made an unfair use of public money. Canning's defence of his friend was eloquent and skilful, but it failed. Mr. Pitt died in January, 1806: in February there was a complete change of ministers, and Mr. Canning was [illegible] by Mr. Sheridan as Treasurer of the Navy. In [illegible]07, Mr. Canning again accepted office, and was [illegible] Secretary of State for Foreign Affairs in the new [illegible]ed by the Duke of Portland. Of all the departments [illegible]nment, this was probably the one he was best qualified [illegible] his dispatches were lucid, manly, and spirited, and many of his state-papers are models of that kind of composition. On the 21st of September, 1809, Mr. Canning fought a duel with his colleague Lord Castlereagh. The qu[illegible] [illegible]ly arose out of the Walcheren expedition, and l[illegible] resignation of the Duke of Portland and Mr. C[illegible] well as of Lord Castlereagh. Mr. Canning h[illegible]een in favour of Catholic emancipation, and on t[illegible] April, 1812, he eloquently supported Mr. Grattan, who moved that the Catholic claims should be referred to a committee of the whole house. Again, on the 22nd of June, 1812, Mr. Canning moved that the House should take the Catholic question into consideration early in the next session, and the resolution was carried by a majority of 129. Whoever looks back through the long history of Catholic emancipation, will see how largely the final success of that measure was owing to the untiring exertions and eloquence of Mr. Canning, who unhappily died a short [illegible] before it could be carried, and left [illegible] honour to [illegible] who had been through life its most vio[illegible] opponents.

Parliament being dissolved in 1812, Mr. Canning was elected for Liverpool, which also returned him in 1814, in 1818, and again in 1820. In October, 1814, he was sent Ambassador to the Prince Regent of Portugal, an appointment which was afterwards the subject of severe animadversion in parliament. In the autumn of 1816, he became President of the Board of Control. During the session of 1819 he again expressed his decided hostility to parliamentary reform. In June, 1820, when the conduct of Queen Caroline, the wife of George IV., was brought before parliament, Mr. Canning rather than bear any part in the proceedings resigned his office, and went to make a tour on the Continent. During the session of 1821 he again supported the Catholic claims with his usual warmth; and in the session of 1822 he again opposed parliamentary reform. In the course of the latter year he was named Governor-General of India, and having made all his arrangements for leaving England, he was at Liverpool to take leave of his friends and constituents, when Lord Castlereagh (then the Marquis of Londonderry, and at the head of foreign affairs) committed suicide on the 12th of August, 1822. On the 16th of September following, Mr. Canning, who had been entreated to give up his much more profitable Indian place, was again appointed Secretary of State for Foreign Affairs. Declining to interfere in the troubled state of Spain, where 'the spirit of unlimited monarchy, and the spirit of unlimited democracy' were in fierce collision, Mr. Canning turned his attention to the new world, and came to the resolution to send out consuls to the principal states of Spanish South America. This was a preliminary to the recognition of the independence of those new governments which, though totally unsettled, were *de facto* free of Spain. Early in 1825 he formally notified to Europe that the British government would appoint diplomatic agents to Columbia, Mexico, and Buenos Ayres; and conclude treaties of commerce with those States on the basis of the recognition of their independence. In December, 1826, carrying the sense of the House almost unanimously along with him, he announced the intention of government to prevent Spain, who had lost her constitution, from interfering with Portugal whose constitution still lingered on, between life and death; but he protested at the same time that the British troops were to go to Lisbon, 'not to rule, not to dictate, not to prescribe constitutions, but simply to defend and preserve the national independence of an ally.'

On the 18th of February, 1827, the Earl of Liverpool, the premier, becoming incapacitated, on the following 12th of April Mr. Canning was appointed his successor. No sooner was this appointment announced, than the Lord Chancellor (Eldon), the Duke of Wellington, Earl Bathurst, the Earl of Westmoreland, Viscount Melville, Lord Bexley, Mr. (now Sir Robert) Peel, with various members of the household, resigned in a manner which showed decided hostility to the new premier. George IV. wished to form a ministry precisely on the principles of that of Lord Liverpool, but these numerous resignations made the scheme impossible, and Mr. Canning commenced (or possibly only concluded) a negotiation with the Whigs, which ended in the admission of several of that party to office, and in the promised support of others, at the head of whom were Mr. Brougham, Mr. Tierney, and Sir Francis Burdett. The opposition to the new premier in the House of Commons was of a most formidable and irritating character; but though he was labouring under anxiety and sickness, his rhetorical powers and his sparkling wit never failed him. It was in these speeches that he repeated his determination to oppose parliamentary reform, and declared himself hostile to the repeal of the Test and Corporation Acts. "On the Test Act, however, he had never before fully delivered an opinion to the House; and his opposition to its repeal, or the agitating that question *then*, may be said by those, who in other respects approve of Mr. Canning's political career, to have arisen out of a fear of complicating and prejudicing the Catholic question. Conceding however to Mr. Canning his full share of merit for his exertions in favour of Catholic emancipation, we cannot admit that he had those enlarged views of social reform, nor those powers and acquirements which entitle him to be considered a great statesman. Mr. Canning spoke in parliament for the last time on the 29th

June, 1827, three days before a [illegible] ation. On the [illegible] of July, a treaty combining [illegible] ngland, F[illegible] and [illegible]ussia, for the settlement of the [illegible] rs of Greece, and of which he had been the main promoter, was signed at London. This was the last of [illegible] Canning's public acts: one of the first poems he wrote in the enthusiasm of youth, was a lament on 'The Slavery of Greece.' About the middle of July, Mr. Canning retired for change of air to the Duke of Devonshire's Villa at Chiswick, where he died on the 8th of August, 1827.

CANNON. The manufacture of cannon is very simple. They are not cast hollow, for it is found that, if so cast, they will not be equally strong in every part, on account of the irregularity in the cooling of the metal. They are therefore cast solid, and thus the outside cools first, with the grain close and sound; while the centre cools last, and the porous or spongy parts consequently are all found in the centre.

The cannon is then put into a lathe with the breech towards the mandril, and the centre of the mouth-end resting on the back-centre of the lathe; the outside of the muzzle is then turned sufficiently to rest in a boring-collar, *i.e.*, a circular hole in a support that is subsequently placed in the lathe. After turning the muzzle, the back-centre is removed, and the boring-collar is pushed against the muzzle and supports it; a long drill is now put to the centre of the mouth, the other end of the drill being either supported by the back-centre and driven forward by the screw, or the drill is supported on a rack, and advanced by a pinion and weight. The lathe being put in motion, the cannon revolves, and the drill bores it to the required size.

Some experiments have lately been made to enlarge the calibre of cannon without enlarging their external dimensions, and some 18 pounders have been bored to carry 32 lb. ball; but in this case it is intended only to throw the ball a short distance.

A method of loading guns at the breech has been proposed by Mr. Tucker:—the gun is bored completely through the breech, and a perpendicular hole is bored at a short distance from the breech; into this hole a strong plug is well fitted by grinding, the plug having a hole through it of the same size as the bore of the gun—the arrangement in fact is just like a common water-cock. When the holes coincide, the cartridge is thrust through the breech, and the plug being turned half round, the gun is charged. A practical objection to loading cannon, or even fowling-pieces at the breech is, that however well the joints may be made they do not long continue tight, the powder inevitably finding its way through.

CANNSTADT, a bailiwick in the Würtemberg circle of the Neckar; with an area of about 31 square miles, and 22,200 inhabitants; one town and five villages and hamlets. It is traversed by the Neckar, and contains several mineral springs and baths, and many Roman antiquities. The chief productions are wine of excellent quality, madder, maize, and tobacco; it manufactures yarns and cottons; and rears cattle.

The town of Cannstadt is on the Neckar, nearly in the centre of the kingdom, and in the bosom of a fertile and beautiful country. It contains about 390 houses, and about 4050 inhabitants. Independently of its trade, for it is the staple town for the traffic in the Neckar, and has manufactures of woollens, cottons, tobacco, &c., there are 37 mineral springs in the neighbourhood and a regular establishment of baths, with grounds laid out for visiters. The Seelberg, an adjoining hill, 640 feet in height, contains fossil remains of the mammoth and rhinoceros, and teeth and bones of unknown animals. Vases, coins, and other Roman antiquities have of late years been found near Cannstadt. The two royal seats, Bellevue and Rosenstein, are in its vicinity. 48° 48′ N. lat., 9° 13′ E. long.

CANON (κανών), a rule. The several senses in which this word is used are all derivatives from its first or original sense: and this sense it appears to have acquired, as itself a derivative from *canna*, (we use the Latin form, though in fact both *canna* and *canon* are Greek terms transplanted into the Latin language,) which signifies a *reed* or *cane*; such a plant as produced straight, round, smooth and even shoots, adapted to the purpose of a *rule*; or as we say, a *ruler*, used in drawing straight lines. The word *cannon* is same with *canon*, and is applied to the instrument of war lled on account of its resemblance to a rule. The word is used in mathematics and in music; and also to express certain grammatical rules formed by the critics. But it is more particularly appropriated to *rule* in respect of things ecclesiastical, and it is in this application of it that we [illegible] here solely and [illegible] to [illegible] of it.

If it is asked why *canon* should be used for *rule* especially in things ecclesiastical, we answer that the most probable reason that can now be given is, that the word was so used by Saint Paul (Gal. vi. 16). 'And as many as walk according to this *rule* (*canon*), peace be on them and mercy, and upon the Israel of God.'

The *rule* here spoken of was the Christian rule, the rule or law of the Christian church: and as these rules became explained or amplified in subsequent times by persons deemed of authority in the church, as by popes, bishops, councils, whether general or particular, these [illegible] rules or explications of the antient and fundamental rules of the Christian church were designated by the t[illegible] or *canons*. Of these there is a great multitude. [illegible] they speak of the canons of the Council of Nice, the canons of the Council of Trent, meaning the decisions of those councils on points of doctrine or discipline submitted to them. The *Apostolical canons* are canons which are supposed to have been agreed upon at a very early period in the history of the church. By some learned persons they have been referred even to the times of the Apostles, whence this name.

The collected body of these canons forms what is called *The Canon-Law*, which in other words is the law of the church, that body of injunctions regulating men's private discipline, and their social relations, which originate, not in the conferences and wills of civil authorities or parliaments, but in the deliberations of ecclesiastical courts or ecclesiastical assemblies, the members of which were ecclesiastics, and the precedents on which they acted the decrees of similar assemblies, or of other persons possessing ecclesiastical authority, or finally, of the most sacred authority of all, that of the Apostles and of the Founder of the Christian church. We may here make a slight deviation from our subject to point out the distinction between the canon law and the civil law. The former is already explained. The civil law is the political and municipal law of the Roman empire. When we hear a person spoken of as doctor of laws, what is meant is, that he is a doctor of both civil and canon law; but the term in Great Britain is now little more than a mere honorary distinction.

Canon is also used for the *rule* of persons who are devoted to a life strictly religious: persons who live according to (religious) rule, such as praying at certain hours, and for a certain length of time, keeping themselves from marriage, eating particular kinds of meat, periodical fastings, and the like. It is applied to the *book* in which the rule was written, and which was read over to such professed persons from time to time: and since in such a book it was not unusual to enter also the names of persons who had been benefactors to the community, which names were recited from time to time with honour, and they were held and reputed to be holy persons or saints (sancti); the entry of such names formed what is meant by *canonization*, though in later times, when it was found that saints multiplied too fast, when every small religious community added any benefactor to their list, the term became confined to such persons as had their names enrolled in the great imaginary volume of which the head of the church was the sole guardian. It was also applied to *persons* who lived under a rule; as the Augustinian canons, persons who adopted the rule of Saint Augustine. And here the distinction is to be observed of *regular* and *secular canons*. The regular canons were persons who were confined to their own monasteries, where they practised their rule; the secular canons were persons living indeed a religious life, or one according to some prescribed Christian form and order, but who nevertheless mixed more or less with the world, and particularly as discharging the various offices [illegible]tianity for the edification and benefit of the [illegible] was the species of canons that are found in [illegible] churches, or in other churches called conventual, as at Southwell in Nottinghamshire, which were all churches of very antient foundation, the centres of Christianity throughout an extensive district. There they lived a kind of monastic life under the presidency generally of a bishop; but issuing forth from time to time to introduce the light of Christian truth into districts into which it had not before penetrated, or to instruct the persons lately received into the church, and to perform for them the various ordinances of Christianity. As parish churches arose the necessity for such visits from the canons in the cathedral churches was diminished. But the institution remained: it was spared at the Reformation and continues to the present day. These canons are sometimes called prebendaries. This arises from their being endowed with land or tithe, as many of them are to a greater or less extent, which endowment is called a prebend. The ca[illegible] have stalls in the cathedral churches, which are generally [illegible] prebendal stalls. They form the chapter in the ex[illegible]ion the dean and chapter, and are still nominally what they actually once were, the council of the bishop for the administration of the affairs of his diocese.

From canon is formed *canonical*, which occurs in many ecclesiastical terms, as *canonical hours*, *canonical sins*, *canonical punishment*, *canonical letters*, *canonical obedience*, *canonical scriptures*. These terms require no explanation, except it be to add that the canonical scriptures are the usually received books of the Old and New Testament.

CANON, in music (*κανών*, a *rule*), a composition, generally vocal, sometimes in two, but commonly in more parts, in which, with the exceptions that will be mentioned, precisely the same melody, or subject, is given to every part. This melody is sung by each, after the leader, either on the unison, or the octave, or on the fourth and octave, &c., below, the voices severally following or answering each other at the expiration of one or more bars. According to many German and French writers the canon is a *perpetual fugue*, but this definition is liable to great objection: indeed, the term *fugue* is itself by no means satisfactory. [FUGUE.]

To compose a canon on the unison, or octave, requires less labour than genius, and, with very few exceptions, is the only composition of the kind that produces a constantly agreeable effect. A canon is said to be written *three-in-one* (or *four-in-one*, &c.) on the unison, when the parts follow on the same degree of the scale. Cherubini's 'Perfida Clori,' and Dr. Hayes's 'Come follow me to the greenwood tree,' are admirable examples of this sort. The renowned 'Non nobis, Domino,' of Birde is an unrivalled specimen of the canon three-in-one, on the fourth and octave below, and Dr. Blow's 'Gloria Patri' (engraved on his monument in Westminster Abbey), a canon four-in-one, on the fifth, octave, and twelfth below, is entitled to the encomiums that have been bestowed on it.

A canon in many parts may have two or even more melodies. Thus a canon four-in-two is for four voices, two singing one melody, two another, both subjects blending. But the canon takes numerous shapes, though it would be a waste of room and time to describe one-tenth of them. The *Canon by Augmentation* is that in which the notes of the answers are double and quadruple in length those of the subject. Dr. Cooke's 'Amen' (regularly sung after 'Non nobis' at the Catch-Club) is an ingenious example of this species. The *Canon by Diminution* is exactly the reverse of that by augmentation. The canon *Recte et Retro* has but one peculiarity, and pretends to only one merit, namely, that it may be sung either forwards or backwards—it is worthy to be sung by those who suffer from excess of leisure, or have no musical ear, or feel the necessity of doing penance. And here we cannot forbear expressing a regret that any composer of real talent should have passed days and nights in the mechanical drudgery of generating such ungraceful offspring as all canons, except those in the unison, [illegible] In schools, as exercises for youth, they may be of some use; but even there, if much importance should be attached to them, the imagination of the student will be in danger of being chilled, and his taste will be liable to become depraved. To reduce art to such rule as canon imposes is preposterous, for it is impossible to name a single composition of the kind that might not have been improved [illegible] of the laws laid down for its formation. Canons i[illegible] what acrostics and *bouts-rimés* are in poetry. [illegible] now disdains such laborious trifling in literature; let us hope that it will soon prove as influential in the sister-art.

CANON (in mathematics). This word, which signifies a rule, has generally been employed to mean a set of mathematical tables. Thus it was customary to speak of the canon of logarithms, of sines, &c. A collection of formulæ has sometimes been called by the same name, and even any mathematical instrumen[illegible]talis, *Lex Math.*)

CANON LAW, a [illegible]n of ecclesiastical constitutions for the regulation of the polity and discipline of the Church of Rome, consisting for the most part of ordinances of general and provincial councils, decrees promulgated by the popes with the sanction of the cardinals, and decretal epistles and bulls of the popes. The origin of the canon law is said to be coeval with the establishment of Christianity under the apostles and their immediate successors, who are supposed to have framed certain rules or canons for the government of the church. These are called the apostolical canons; and though the fact of their being the work of the apostles does not admit of proof, there is no doubt that they belong to a very early period of ecclesiastical history.

These rules were subsequently enlarged and explained by general councils of the church. The canons of the four councils of Nice, Constantinople, Ephesus, and Chalcedon (which were held at different times in the fourth and fifth centuries), received the sanction of the secular power by a law of the Emperor Justinian. (Novel. 131, cap. 1.) The chapter referred to, after confirming the decrees of the four councils, adds, 'we receive the doctrines of the aforesaid holy synods (*i. e.* councils) as the divine Scriptures, and their canons we observe as laws.' Collections of these canons were made at an early period. The most remarkable of these collections, and that which seems to have been most generally received, is the Codex Canonum which was compiled by Dionysius Exiguus, a Roman monk, A.D. 520. This body of constitutions, together with the capitularies of Charlemagne and the decrees of the popes from Siricius (A.D. 398) to Anastasius IV. (A.D. 1154), formed the principal part of the canon law until the twelfth century. The power of the popes was then rapidly advancing to the height which it afterwards attained, and their jurisdiction being constantly extended by new encroachments, required a uniform system of law for the regulation of their decisions.

This necessity excited the active zeal of the monkish lawyers. After some minor compilations had appeared, a collection of the decrees made by the popes and cardinals was begun by Ivo, bishop of Chartres, A.D. 1114, and perfected by Gratian, a Benedictine monk, in the year 1150, who first reduced these ecclesiastical constitutions into method. The work of Gratian is in three books, arranged and digested into titles and chapters in imitation of the Pandects of Justinian, and is entitled 'Concordia discordantium Canonum,' but is commonly known by the name of 'Decretum Gratiani.' It comprises a series of canons and other ecclesiastical constitutions from the time of Constantine the Great, at the beginning of the fourth, to that of Pope Alexander III., at the end of the twelfth century. The Decretals, which were rescripts or letters of the popes in answer to questions of ecclesiastical matters submitted to them by private persons, and which had the authority of laws, were first published A.D. 1234, in five books, by Raimond de Renafort, chaplain to Pope Gregory IX. This work, which consists almost entirely of rescripts issued by the later popes, especially Alexander III., Innocent III., Honorius III., and Gregory IX. himself, forms the most essential part of the canon law, the Decretum of Gratian being comparatively obsolete. These decretals comprise all the subjects which were in that age within the cognizance of the ecclesiastical courts, as the lives and conversation of the clergy, matrimony and divorces, inquisition of criminal matters, purgation, penance, excommunication, and the like. To these five books of Gregory, Boniface VIII. added a sixth (A.D. 1298), called 'Sextus Decretalium,' or the 'Sext,' which is itself divided into five books, and forms a supplement to the first five books, of which it follows the arrangement. The Sext consists of decisions promulgated after the pontificate of Gregory IX. The Clementines, or Constitutions of Clement V., were published by him in the council of Vienna (A.D. 1308), and were followed (A.D. 1317) by those of his successor, John XXII., called Extravagantes Johannis. To these have since been added some decrees of later popes, arranged in five books after the manner of the Sext, and called Extravagantes Communes. All these together, viz., Gratian's Decree, the Decretals of Gregory IX., the Sext, the Clementines, and the Extravagants of John XXII. and his successors, form what is called the Corpus Juris Canonici, or body of canon law. Besides these, the institutes of the canon law were compiled by one John Lancelot, by order of Paul IV., in the sixteenth century; but it appears from the author's preface that they were never publicly acknowledged by the popes.

And in 1661 was published a collection of the decretals different councils, which is to be found in some editions the Corpus Juris Canonici, but this likewise has never received the sanction of the Holy See.

The introduction of this new code into the European commonwealth gave rise to a new class of practitioners, commentators, and judges, almost as numerous as those who had devoted themselves to the study and exposition of the civil law, from which, as from an analogous system of jurisprudence, they looked for aid in all cases of difficulty and doubt. In fact, the two systems of law, though to a certain extent rivals, became so far mutually entwined, that the tribunals of the one were accustomed, wherever their own oracles were silent, to adopt the rules of decision that prevailed in those of the other.

The main object of the canon law was to establish, by means of the legislative authority of the pope, the supremacy of ecclesiastical authority over the temporal power, or at least to assert the total independence of the clergy upon the laity. The positions, that the laws of laymen cannot bind the church to its prejudice, that the constitutions of princes in relation to ecclesiastical matters are of no authority, that subjects owe no allegiance to an excommunicated lord, are among the most prominent doctrines of Gratian's Decretum and the decretals. We have shown in a former article [BENEFICE, vol. iv. p. 218] that the encroachments of the church upon temporal rights and authorities were never encouraged in England. The doctrines of passive obedience and non-resistance, so slavishly inculcated by the decretals, were not likely to be relished by the rude and fierce barons who composed the parliaments of Henry III. and Edward I. Accordingly we find that this system of jurisprudence never obtained a firm or extensive footing in this country: and our most eminent lawyers, in all periods of our history, have shown great unwillingness to defer to its authority. It is well observed by Blackstone (*Com.* i. p. 80) that 'all the strength that either the papal or imperial laws have obtained in this realm is only because they have been admitted and received by immemorial usage and custom in some particular cases and some particular courts; and then they form a branch of the *leges non scriptæ*, or customary laws; or else, because they are in some other cases introduced by consent of parliament, and then they owe their validity to the *leges scriptæ*, or statute law.' There was indeed a kind of national canon law, composed of *legatine* and *provincial* constitutions, adapted to the exigencies of the English Church. Of these the former were ecclesiastical laws enacted in national synods held under the cardinals Otho and Othobon, legates from Pope Gregory IX. and Clement IV. in the reign of Henry III. The provincial constitutions were the decrees of provincial synods held under divers archbishops of Canterbury, from Stephen Langton, in the reign of Henry III., to Henry Chichele, in the reign of Henry V., and adopted also by the province of York in the reign of Henry VI. (Blackstone, *Com.* i. p. 83; Burn's *Eccl. Law*, preface.)

With respect to these canons it was, at the time of the Reformation, provided by stat. 25 Henry VIII., c. 19 (afterwards repealed by 1 Philip and Mary, c. 8, but revived by 1 Eliz. c. 1), that they should be reviewed by the king and certain commissioners to be appointed under the act, but that, till such review should be made, all canons, constitutions, ordinances, and synodals provincial, being then already made and not repugnant to the law of the land or the king's prerogative, should still be used and executed. No such review took place in Henry's time; but the project for the reformation of the canons was revived under Edward VI., and a new code of ecclesiastical law was drawn up under a commission appointed by the crown under the stat. 3 and 4 Edward VI. c. 11, and received the name of Reformatio Legum Ecclesiasticarum. The confirmation of this was prevented by the premature death of the king, and although the project for a review of the old canons was renewed in the reign of Elizabeth, it was speedily dropped, and has not been since revived.

The result of this is, that so much of the English canons made previously to the stat. of Henry VIII. as are not repugnant to the common or statute-law, is still in force in this country. It has however been decided by the Court of King's Bench that the canons of the convocation of Canterbury, in 1603 (which, though confirmed by the king, never received the sanction of parliament) do not (except so far as they are declaratory of the antient canon law) bind the laity of these realms. (Middleton *v.* Croft; Strange's *Reports*, 1056.) It was however admitted by Lord Hardwicke, Ju [illegible] e above-mentioned case, that [illegible] ns which are confirmed by [illegible]

There are two species of courts in England, in which the canon law is under certain restrictions used. 1. The courts of the archbishops and bishops and their derivative officers, usually called in our law Courts Christian, *Curiæ Christianitatis*, or ecclesiastical courts. 2. The courts of the two universities. In the first of these, the reception of the canon law is grounded entirely upon custom; but the custom in the case of the universities derives additional support from the acts of parliament which confirm the charters of those bodies. They are all subject to the superintendence and control of the courts of common law, which assume the exclusive right of expounding [illegible]es relating to the ecclesiastical courts, and will prohibit them from going beyond the prescribed limits of their respective jurisdictions; and from all of them an appeal lies to the king in the last resort.

Before the Reformation, degrees were as frequent in the canon law as in the civil law. Many persons became graduates in both, or *juris utriusque doctores*; and this degree is still common in foreign universities. But Henry VIII., in the twenty-seventh year of his reign, issued a mandate to the university of Cambridge, to the effect that no lectures on canon law should be read, and no degrees whatever in that faculty conferred in the university for the future*. It is probable that Oxford received a similar prohibition about the same time, as degrees in canon law have ever since been discontinued in England.

Before we conclude this article, it may be as well to observe that the Decree of Gratian and the Decretals are usually cited not according to book and title, but by reference to the first word of the canon, which renders it necessary for the modern reader to consult the alphabetical list of the canons, in order to find out the book, title, and chapter, under which the canon he wishes to consult is to be found.

CANO'PUS or CANO'BUS (Κάνωβος), a city of Egypt, on the coast near the outlet of the western or Canopic branch of the Nile. It was 120 stadia from Alexandria by land, with which it was connected by a canal. In the time of Strabo (p. 801) it contained a great temple of Serapis.

CANOPUS is also the name of an Egyptian jar of a big-bellied form, with a cover or top representing a human head or that of some animal. These vessels are generally made of baked earth, sometimes of alabaster, and even of green basalt. Some have hieroglyphics on them, and are painted and glazed. Bodies of sacred animals are sometimes found in these vessels. Canopus is the Greek form of the name of an Egyptian deity; but whether the deity was the same as Cnuph or Cneph, as some assert, we cannot tell. Earthen jars of this form seem to have been used for keeping water cool, as they still are in Egypt.

CANO'PUS, a star of the first magnitude, in the rudder of the constellation Argo. In Ptolemy it is κάνωβος (*canôbus*), in Pliny *canopus*. It does not become visible to any part of the earth higher in latitude than the southern part of the Mediterranean.

Hyginus, the author of a book of gossip about the stars, and Martianus Capella, a poet (cited by Grotius), have stated that Canopus was a star in the constellation Eridanus, which they say was the Nile, and the star was therefore the island of that name. Sir John Hill, a modern Hyginus, author of just such another work, has stated that 'some old astronomers' have placed Canopus as above described; and Dr. Hutton, who should not have made an authority of Sir John Hill, has copied his words, and repeated the mistake in his Mathematical Dictionary. It therefore becomes worth while to correct it.

CANOPY, the covering over a niche u[illegible] Gothic architecture. These canopies afford an opportunity for the display of considerable taste and ingenuity; they are usually elaborately carved. Being intended not merely as a covering to protect the statues under them from the weather, but as a mark of distinction also, they were used like a baldachin. The various Gothic edifices in England present numerous examples of canopies, and they occur frequently on the tombs of our kings and princes, placed horizontally, and therefore in such a situation as clearly shows that they are intended, like a baldachin, to be a mark of honour, and not a mere covering.

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* Stat. Acad. Cantab., p. 137.

CANO'VA, [illegible]O'NIO, was born November [illegible]7, at Possagno, a considerable village in the province of [illegible]gi, in the Venetian terri[illegible]

The father of Canova worked [illegible] was also an architect of some merit, so that his son may be said to have been initiated from his very birth in the pursuit in which he became so distinguished. At fourteen years of age Canova was taken by his father to Venice, and having obtained the notice of Giovanni Faliero, a senator, he was through his recommendation received into the studio of one Bernardi, surnamed Torretti; and afterwards, on Torretti's death, into that of his nephew, Giovanni Ferrari. Two baskets of [illegible] and flowers carved in marble for Faliero are still shown at Venice as the earliest finished productions of Canova's [illegible]. About this time he commenced his first work of imagination, a group of Orpheus and Eurydice, which he modelled at his native village, during the time that he used to walk to Venice to attend the academy. Having now acquired some reputation, and being recommended by his first kind protector Faliero, he was employed on some other works, chiefly busts; and he also modelled his group of Dædalus and Icarus—a work which may be said to have laid the foundation of his future fame. In the year 1779 the Cav. Zuliano was sent ambassador from Venice to Rome, and the senator Faliero, anxious to advance the studies of the young sculptor, gave him a recommendation to that functionary. In October of that year he arrived at Rome, accompanied by Fontana, a Flemish painter. His group of Dædalus and Icarus was sent to him, and the account of the impression which it made is interesting. Zuliano was one of the most distinguished patrons and admirers of the fine arts, and his palace was the rendezvous of all the best artists, critics, and literati of the day. The work of Canova being well placed in one of the saloons, a large party of connoisseurs, consisting of Cades, Volpato, Battoni, Gavin Hamilton (a painter), the Abbate Puccini, and others, were invited to dinner, and after the repast they were conducted into the room where were the artist and his group. The qualities of art which they were now called upon to judge, viz., simplicity, expression, and unaffected truth to nature, were so different from that which was the mode, and to which they had been accustomed, and which some of the party no doubt thought excellent, that for some time there was a profound silence. Gavin Hamilton at length relieved the youthful sculptor from his embarrassment, pronounced the highest encomiums upon his work, and gave him at the same time kind and valuable advice and encouragement. This liberality was not thrown away upon the amiable heart of Canova, who, through his long career of success, always acknowledged with gratitude the important service thus rendered him by Mr. Hamilton. Canova returned to Venice, but soon after established himself in Rome, having obtained a pension from his government of 300 ducats a year for three years. His first work after his settlement there was a group of Theseus and the Minotaur; an extraordinary production for the time, and showing a feeling for the purer principles of art, both in composition and the style of the naked, totally distinct from the wretched manner that characterised the performances of his contemporaries, and of those who had for some years preceded him. His admitted superiority of talent required but little aid from the influence of his noble protectors to procure him some important employment, and he was selected to execute the monument of Ganganelli (Pope Clement XIV.) for the church of the SS. Apostoli, in Rome. This noble work of art was exhibited in 1787, and established at once Canova's claim to the highest rank in his profession. There is a curious and interesting letter extant from Milizia, the Aristarchus of his day, as Cicognara calls him, to the Conte San[illegible] on the first exhibition of this monument. It speaks in terms of most unbounded admiration of the work, hoping that it may lead to the 'risorgimento'—the restoration of real art! Before this was completed Canova had commenced his model of Rezzonico's (Clement XIII.) monument. This work is in St. Peter's, and is a splendid effort of genius, and of skill in execution. The angel of death and the two lions at the base of this composition cannot be too highly praised. A story is told in Rome of Canova's putting on a monk's dress and cowl, and in this disguise mixing with the crowd, to hear the criticisms that were made when the work was first exposed to public view.

From [illegible] Canova was constantly employed, and chiefly on subjects of imagination. His Cupid and Psyche, his fine group of Hercules hurling Lycas from the rock, Theseus with the Centaur, the Graces, Statues of Nymphs, Endymion, &c. &c., are too well known, if not in the originals at least by engravings, to require description here. In portrait Canova was considered less successful; though none who have seen his Popes Ganganelli, Rezzonico, and Braschi, will deny his power even in that branch of his art. It is fair to judge by the best works, and the highest authorities have pronounced the head of the last mentioned Pope, Pius VI., to be a masterpiece of the art. For the union of portrait with ideal (that is, elevated) form, we would instance the statues of Napoleon, and of Letizia, mother of Napoleon. From among the great number of monumental groups executed by Canova besides those of the popes already mentioned, that of Maria Christina, in the church of Santa Maria de' Frari at Vienna, is characterized by simplicity of composition, expression, and exquisite finish.

Canova travelled when young over part of Germany, and was twice in Paris. At his last visit, when sent there by the Roman government to superintend the removal of the works of art which had been taken to Paris by the French, and which the Allies had decided should be restored to Italy, he proceeded to England, chiefly for the purpose of seeing the Elgin marbles, of which he always spoke in terms of the highest admiration, saying that the sight of such exquisite works was sufficient to repay him for his journey from Rome. His reception in England gave him the greatest satisfaction, and he took every opportunity of expressing feelings of admiration and gratitude towards this country. On his return to Rome he received a patent of nobility, and was created Marquis of Ischia. As remarkable for his unpretending modesty as for his talent, Canova never assumed his high title, though he was of course addressed by it, but to the last called himself and left his cards as Antonio Canova.

In the latter part of his life Canova was busily occupied in modelling decorations, such as a group of a Deposition and some bassi rilievi for a church which he had built in his native place; and it was at Venice, where he was staying to be near this object of his interest, that he died in October, 1822, after an illness of a very few days.

Canova was rather below the common stature, and latterly stooped as he walked. His features were strongly marked, but of fine form; his nose aquiline, and his eyes deeply set and full of expression. The general character of his countenance was extremely pleasing and prepossessing, a smile usually playing about his lips, indicative of the good-nature and kindness of disposition for which he was eminently distinguished.

Of most amiable and conciliating manners towards his brother-artists and competitors for fame, he was also the liberal supporter and encourager of students of rising talent. He gave pensions to several whose means were insufficient without such assistance, and established out of his own purse a handsome premium for sculpture in the academy of St. Luke, at Rome, of which he was 'Principe,' or perpetual president.

In execution, and the whole treatment of his marble, Canova was unrivalled; but those who are competent to judge sculpture by the pure principles of Greek art (or, in other words, of nature, selected and exhibited in its finest and most approved forms), will perhaps discover in many of his works some affectation, both in the attitudes and expression, and a littleness in some of the details, which are not in accordance with the simplicity and breadth of style of the best productions of the antients. Admitting this to be the case (particularly in some of his latter performances), and that the criticism is therefore just, still his works evince so great a progress in art, and in many respects approach so much more nearly than those that had for a long period preceded them, to the excellence of antient sculpture, that Canova must be confessed to be one of the great regenerators of the art; and his name, to which we may fairly add that of our countryman Flaxman, as the restorer of a pure style of design, will ever be held in honour by those who wish to see sculpture practised upon true principles.

For further particulars of Canova's life and works, see chiefly Cicognara, *Storia della Scultura*, tom. iii.; and Missirini, *Vita di Canova*, 8vo.

CA'NTABRI, a people of antient Spain, who lived E. of the Asturians, in the region now called Las Montañas de Santander. To the E. they bordered on the Autrigones and the Varduli, or scayans. To the S. the seem to have extend beyond the mountains into part of the present vince of Palencia, where they dered on the Vaccæi. (Mannert, *Geographie der Griechen und Römer.*) They were a brave, secluded, half wild race, who long resisted the Romans, and were only finally subdued, together with the Asturians, by Augustus, B.C. 25. They revolted again, after some years, but were defeated and nearly exterminated by Agrippa B.C. 19. In the division of Spain made by that emperor the Cantabri were included in the Tarraconensis province. They gave their name to the Oceanus Cantabricus, now Gulf of Biscay.

CANTACUZE'NUS, JOANNES, emperor of Constantinople. [BYZANTINE HISTORIANS.]

CANTAL, a department of France, the most southern of the two into which the former province of Auvergne has been divided. It is of a very irregular form, having its greatest dimension or length from N.E. (near Massiac) to S.W. (near Maurs) sixty-seven miles; and its greatest breadth at right angles to the above about fifty-six miles. The surface comprehended in it is, according to M. Balbi, equal to 2090 square miles, being rather larger than the English county of Norfolk. It is bounded on the N. by the department of Puy de Dôme, on the N.W. by that of Corrèze, on the S.W. by that of Lot, on the S. by that of Aveyron, on the S.E. by that of Lozère, and on the E. by that of Haute Loire (Upper Loire). Aurillac, the chief town, is 270 miles nearly due S. from Paris in a straight line; or 332 by the road through Orleans, Limoges, and Tulle. The population in 1832 was 258,594, or nearly 124 to a square mile.

Cantal is one of the most mountainous departments in France. The mountain from which the department takes its name, Le Cantal, is near the centre of the department, and approaches in figure to a depressed irregular cone. In common with most of the other mountains of Auvergne it is of volcanic origin; and the lava, probably in consequence of its superior fluidity to that ejected from Mont Dor, has spread to a considerable extent without accumulating into such enormous masses as those which distinguish the neighbourhood of the latter. The valleys which furrow the sides of Le Cantal are less numerous, or at least narrower than those of Mont Dor: they stretch out on every side like rays from the central heights into the surrounding country; they are generally deep, and bounded by steep and rocky walls, and exhibit on each side corresponding sections of the volcanic beds through which their excavation has been effected, and towards their termination cut into the base of the primitive rocks by which the beds of lava are supported. The elevation of Le Plomb de Cantal, the summit of the mountain, above the level of the sea, is 6090 or 6094 feet. Several streams rise on the slope of this central mountain mass: the Sautoire, the Rue, the Mans, and several others, rise on the northern side, but flow N.W. into the Dordogne; the same river also receives the streams of the Marone, the Cère, and others, which rise on the western slope: the streams which rise on the S. side flow into the Trueyre, while the Alagnon which rises on the eastern side flows into the Allier. The Celle rises in the south-western part of the department, and flows into the Lot; and the Trueyre which rises in the adjoining department of Lozère, and falls into the Lot, waters the S.E. part, receiving in its course many tributaries. The Bés, a tributary of the Trueyre, skirts part of the south-eastern boundary of the department; the Dordogne, a part of the north-western. The road from Paris to Narbonne, Perpignan, and the E. of Spain, crosses the eastern side of the department, running through St. Flour: this is a *route royale* (government road) of the first class; a *route royale* of the third class crosses the western side of the department through Mauriac and Aurillac; another road of the same class runs from Aurillac through Murat to St. Flour; and two others run from Aurillac, one N.W. to Argentat (Corrèze), the other S.W. to Figeac, Villefranche, and Toulouse.

For the geology of this mountain mass, we refer to the article AUVERGNE, geology of.

The agricultural and manufacturing industry of the department is thus described in the last edition of Malte Brun's *Géographie Universelle*. 'In the elevated valleys, on the most lofty crests, and even to the summit of the Plomb de Cantal, the most important mountain of this groupe, of which it occupies the central point, the pastures and meadows are covered with cattle; their extensive pasturage affords nourishment even to those of the neighbouring departments. The oxen fattened in the department of are sent to every part of France; the sheep are sent southern departments; the goat skins and kid skins, which constitute an article of trade between this department and that of Aveyron, are sent to Milhau, where they are made into parchment; the horses, small in size, but strong, are used for the light cavalry. It is in the *burons*, huts scattered among the pasture lands, that the milk of the flocks is made into butter and into cheese of three different qualities. The farmer grows rye and buck-wheat, the chief articles of his food; flax, which in fineness rivals that of Flanders; hemp, which is woven into coarse cloth, used in our navy, or sold to the Spaniards; potatoes; fruit-trees of various kinds, especially chestnut-trees, the fruit of which is much used for food; and lastly, some vines which yield only a middling wine. The manufactory of kettles, and various culinary utensils in copper, and the manufacture of lace make up nearly the whole industry of the department: no mines are worked, with the exception of some coal-pits; but a great number of the inhabitants every year travel into other parts of France, into Spain, and even into Holland, to follow their trade as braziers. In the southern part of the department on the right bank of the Rance, the 1500 inhabitants of Maurs (population more exactly 1668 for the town, 2892 for the whole commune), raise many hogs, and carry on a large trade in hams.'

This department is divided into four arrondissements: Aurillac on the S. and S.W. (population 95,284); Mauriac on the N.W. (population 63,003); Murat on the N.E. (population 35,364); and St. Flour on the E. and S.E. (population 64,943). Two towns only are of sufficient importance to require notice in a separate article; Aurillac, the capital, on the Jourdanne, a feeder of the Cère (population 8704 for the town, and 9766 for the commune); and St. Flour, an episcopal city on the Lende, a feeder of the Trueyre (population 5813 for the town, 6464 for the whole commune). [AURILLAC; FLOUR, ST.] Of the others we shall give some account here.

Mauriac, the chief place of one of the arrondissements, is on the side of a basaltic hill which rises between the rivers Auze or Ouze and the Dordogne. One edifice, built a few years since, serves at once the purpose of the town-hall, and of the office of the sub-prefect. Mauriac has a public walk, commanding an extensive view, and the environs of the town are in several parts distinguished for their picturesque scenery. The elevated situation of this town causes the atmosphere to be very cold. The inhabitants amount to 2395 for the town, or 3530 for the whole commune. They carry on trade in cattle and horses.

Murat, also the chief place of an arrondissement, is on the bank of the river Alagnon near its source, and on the road between Aurillac and St. Flour. The inhabitants are engaged in manufactures; the men in that of coarse woollen cloth, the women in that of lace. The population amounts to 2563 for the town, and 2941 for the whole commune: they carry on a trade in cheese.

Vic en Carladez, near Aurillac, is on the bank of the Cère. It has a population of about 2500: the females are remarkable for their blooming complexion and graceful carriage. There are some mineral waters in this town, which are well frequented; they are cold in their temperature, and diuretic in their operation.

Chaudes Aigues, near the Trueyre, was known to the Romans under the name of *Calentes Aquæ*. The baths there are called by Sidonius Apollinaris, in allusion to the baths of Baiæ near Naples, *Calentes Baiæ*. The ordinary population of this town is about 2000; but in the bathing season it is doubled. The waters rise to the temperature of 80° of Reaumur, or 212° of Fahrenheit, accordi table given in Malte Brun's *Géographie Universell* according to the more moderate statement in the work, they vary from 20° to 65° of Réaumur, or 178° of Fahrenheit. The waters are of a heal er. They are made to answer all the domestic purposes of warm water; and being distributed by underground channels, serve to warm the apartments on the ground-floor of the houses in winter. Some lace is made in this place.

Carlat, near Aurillac, is remarkable for the ruins of an old castle on the crest of a basaltic rock, formerly the principal fortress of Auvergne. The population of Carlat is about 1000.

Salers, between Mauriac and Murat, is built on a bed of volcanic matter, and gives name to the surrounding mountains, on which the finest cattle in Auvergne are reared; the mountaineers have the character of in[illegible] nation and quarrelsomeness. Some woven coarse linens, are made at Salers, and at *Pleaux*, (population of town 1634, of whole commune 3123,) near Mauriac; and some leather is tanned at *Allanches*, near Murat.

The department of Cantal sends three members to the Chamber of Deputies. It constitutes the bishopric of St. Flour; and is under the jurisdiction of the *Cour Royale* of Riom. It is in the nineteenth military division, of which Lyon is the capital.

CANTATA, in music (from *cantare*, It. *to sing*), originally signified a short lyric drama, consisting of recitative, airs, duets, and occasionally choruses, the subject of which was sometimes sacred, but more commonly of the erotic kind. The invention of the cantata is generally ascribed to Giacomo Carissimi, pontifical Maestro di Cappella, about the year 1650. Subsequently it assumed a more contracted form, and was written for a single voice. Of the latter kind the most celebrated are those of Alessandro Scarlatti, Handel, Porpora, Marcello, Pergolesi, &c. Purcell's 'Mad Bess' and 'From rosie Bowers' are cantatas that far exceed in depth of feeling and richness of harmony any that either preceded or followed them. Dr. Pepusch's 'Alexis,' a lighter composition, is a justly-admired cantata; and Dr. Arne's 'Cymon and Iphigenia,' for simplicity and sweetness of melody, is entitled to our notice.

CANTEEN, a small wooden vessel capable of containing three pints, which is carried by each soldier on the march on foreign service or in the field. The use of them has been some time general in the British army; they are usually made of oak and painted blue. They are slung over the shoulder by a leather strap, and have the number or apellation of the battalion and regiment, and the number or letter of the company to which they belong painted on one end.

Another kind of canteen is a square box fitted up with compartments, in which officers on foreign service pack a variety of articles, such as spirit-bottles, tea and sugar canisters, plates, dishes, knives, forks, glasses, and other requisites for the table.

A canteen is also a place in barracks where a licensed sutler is allowed to sell provisions, liquors, coffee, &c. to non-commissioned officers and privates, and the quartermaster of the regiment is responsible that no irregularity occurs; the sale of wine, beer, or spirits is not allowed except at the canteen, and the quantity sold at one time is regulated by the commanding officer.

CANTEMIR, DEMETRIUS, was born in 1673 of a family originally from Little Tartary. His father was governor of Moldavia, and Demetrius obtained of the Porte the same office in 1710. But differences arose between him and the grand vizier, in consequence of which Cantemir entered into negotiations with Peter the Great, and revolted against the Porte. After Peter's retreat in 1711 he was obliged to quit Moldavia and to accompany the Russian army. Peter gave him in compensation lands in the Ukraine, and created him a prince of the Russian empire. Cantemir died on his estate in the Ukraine in 1723. He left several works: 'History of the Origin and of the Decay of the Ottoman Empire,' written originally in Latin, and translated both into French and English; 'On the State of Moldavia,' with a map of the country; 'History of Moldavia, Antient and Modern,' in the Moldavian language; 'Introduction to the Music of the Turks;' 'System of the Mohammedan Religion,' written in the Russian language, and dedicated to Peter the Great. Cantemir was acquainted with many languages; he was also member of the Academy of Berlin. His son Antiochus was Russian ambassador at Paris, where he died young in 1744. He wrote several works in Russian; his 'Satires' were translated into French by the Abbé Guasco.

CANTERBURY, a city of Kent, and the metropolitan see of all England, stands on the river Stour, on the high road from London to Dover, in 51° 17′ N. lat., 1° 15′ E. [illegible] from Greenwich observatory. On the W. it joins [illegible] hundred of Westgate, on the N. the jurisdiction of Fordwich, and, towards the S. and E., the hundred of Bridge and Petham. At the time of the Roman occupation it was of considerable importance, as is evident from the Roman military roads to Dover and Lympne, their two principal havens. The ancient British name seems to have been Durwhern, in [illegible] into Durovernum, signifying a [illegible] was probably given to it from the circumstance [illegible] tour running through the city with some rapidity. [illegible] Saxons it was called Caer-Cant, or the city of Kent; w[illegible] we have Cantuaria, and Cant[illegible] There is no historical evidence to show what was its con[illegible]tion under the Britons or Romans, but there is no dou[illegible] that it was a place of importance; for at the beginning [illegible] the Saxon Heptarchy it was considered the chief city of the kingdom of Kent, and was the king's residence. Canterbury is pleasantly situated between hills of a moderate height, the air is salubrious, and the neighbouring country fertile. The city extends about half a mile from E. to W., and somewhat more from N. to S.; the circuit is about a mile and three quarters, and there are four suburbs at the four cardinal points. Many Roman coins, and Roman and Celtic remains, have been discovered in the city and neighbourhood.

Canterbury, in early times, suffered repeated ravages, and particularly from the Danes in 1011, when a great part of it was reduced to ashes. It has likewise frequently suffered by fire, the most calamitous instances of which were in the reigns of Henry II. and Henry VIII.; but it always recovered from these disasters, owing to its rank as the metropolitan city; and the constant resort of pilgrims tended in no small degree to enrich it. At Canterbury was founded the first regular Christian establishment of Augustine, who, in the year 597, baptized Ethelbert, king of Kent, and 10,000 Saxons in the river Swale. Augustine was the first archbishop, and died here in the year 604. His body was first buried in the monastery of St. Augustine, and afterwards, in 1091, was removed into the cathedral. Among the most celebrated of the archbishops are Thomas à Becket, who was murdered before the altar by four of the attendants of King Henry II. in 1171, and Thomas Cranmer, who was burnt at Oxford in the reign of Queen Mary. The cathedral, one of the most noble buildings in England, is of very antient date; indeed, it disputes priority of origin (a matter which it would be difficult to settle) with the church of St. Martin, near Canterbury, which is generally admitted to be the oldest Christian church in England. Augustine is supposed to have commenced his cathedral on the site of a church which was built, during the Roman dominion in Britain, for the use of the Christian soldiers. The various parts of this cathedral having been built in different ages, its architectural character is of course various; but notwithstanding this, all the parts are so disposed as to produce a pleasing effect. The south side is most strongly marked by this diversity of style. The eastern end, called Becket's Crown, from having been finished during his tenure of the archbishopric, is circular; and the northern bears some resemblance to the southern. The south porch is a handsome embattled structure, with a roof of stone. The great tower is considered to be one of the most chaste and beautiful specimens of the pointed style of architecture in England. There are many windows of painted glass, of which the great western is the most remarkable. The stone screen behind the choir, and that behind the altar, lately erected, are much admired. The cathedral contains many monuments of regal and other personages. The choir is one of the most spacious in the kingdom, being nearly 200 feet in length, from the west door to the altar, and thirty-eight in breadth between the two side doors. The extreme length of the whole building, from east to west, is 514 feet, and the extreme breadth seventy-one feet. The height of the great tower is [illegible]35 feet. The cathedral has of late years undergone, and is undergoing, great repairs and judicious restoration, at the expense of the dean and chapter. One of the two towers at the west end is now (1836) in course of being rebuilt with stone from Caen in Normandy, of which the whole cathedral is constructed, except those pillars which are of Purbeck stone. The present establishment consists of a dean, twelve prebendaries, six preachers, six minor canons, and the usual officers. The grammar school, which is within the precincts, and is supported by the chapter, is called the King's School, having been re-modelled by Henry VIII. This school was originally founded by Theodore, archbishop of Canterbury, who died about 690. Among the ruins of antient buildings may be noticed the walls of a castle, said to have been built by William the Conqueror, which is on the S.W. side of the city, near the entrance from Ashford. These remains appear to have been the keep, or donjon, of a fortress, within which it stood, and of which the bounds may still be traced, like those of the castles at Dover, Rochester, and the White Tower in London: the building, being much in the same style with those just mentioned, may be about the same age. The ruins of the palace, which was originally built by Archbishop Lanfranc, are adjoining the borough of Staplegate, a suburb of the city. The ruins of St. Augustine's Monastery, so called either as having been built by or dedicated to him, are in the eastern suburbs: this abbey and its precincts occupied sixteen acres of ground, which were inclosed by a wall. The fine gateway of St. Augustine, which formed the chief entrance, was in a dilapidated state, but has been repaired within these few years by public subscription. The Pilgrims' Passage, by Mercery Lane, on the N. side of the High Street, is towards the cathedral. Canterbury contains fourteen parish churches, and several dissenting chapels. The charitable institutions, for education, for the maintenance and relief of the aged and infirm, and other purposes, are numerous. The city and county hospital, a valuable and well-conducted establishment, was completed in the year 1798, and was erected and is now supported by voluntary contributions. The undercroft of the cathedral was given to the Walloons by Queen Elizabeth in 1568; who introduced the art of silk-weaving, which was afterwards prosecuted to a very considerable extent. This manufacture is now extinct. Canterbury city has long been noted for its brawn, an article of delicacy, which is sent to all parts of the kingdom. The trade in wool is large, but the chief trade is in corn and hops; for the cultivation of which latter article the soil of the neighbourhood is particularly favourable. There are many mills on the banks of the Stour, some of which do a great deal of business. Frequent attempts have been made to render the Stour navigable from the sea to the city for ships of 150 tons burthen, but the probable smallness of revenue has always prevented the undertaking. A railway, constructed within the last five or six years, from Whitstable to Canterbury, is in full work, and has rendered very considerable benefit to the trade of the town. The carriage of coals and heavy goods has been reduced one half. Of the public buildings the guildhall, the fruit and vegetable market, the new corn and hop exchange, the butter and fish markets, the philosophical museum, and the assembly rooms, are the chief. At the S.E. corner of a field, close to the city wall, is a large artificial mound, or circular hill. In the year 1790 Mr. Alderman James Simmonds, to w[illegible] [illegible]ity [illegible] [illegible]sted for many improvements, converted this place [illegible] city mall; the sides of the hill were also cut in[illegible] [illegible]tine walks, so as to admit an easy ascent to its summit, and were connected with a terrace formed upon th[illegible] [illegible]t within the wall, extending in length upwards of 600 yards. additional walks were also made in the field in which it is situate, called the Dane John or Donjon field, and a double row of limes was planted on the sides of the principal walk. The public-spirited conduct of this individual [illegible] commemorated by a pillar placed on the summit of the mound. Some springs of mineral waters were accidentally discovered in 1693 on premises now used as nursery ground, and have from that [illegible] to the present been highly esteemed for their medicinal properties. One is purely chalybeate, and the other contains a portion of sulphur in combination with the [illegible]. During the severest seasons these waters never freeze.

The city of Canterbury was in ancient times part of the royal demesnes, and was under the government of an officer appointed by the crown, styled the prefect, portreeve, or provost, who had all the civil authority, and accounted yearly to the king for the [illegible]ral profits arising from the city. In the last year of King John two bailiffs appear to have been appointed for these purposes, and to have continued till the 18th of Henry III., when the citizens were empowered to choose bailiffs for themselves. This constitution of the city remained until the 26th of Henry VI., when a charter of further liberties and privileges was granted, and that form of municipal government established which existed until the operation of the Municipal Reform Act. By the charter of Henry, and a subsequent partme[illegible] the 31st of his reign, the governing body consisted Brun s *Géogra*[illegible]ecorder, twelve aldermen, twenty-four common on the most [illegible] sheriff, town clerk, and other subordinate offi- P [illegible] Cat[illegible] arter was confirmed and enlarged by Edward groupe, of which [illegible] ed the bounda[illegible] [illegible]f the jurisdiction, and and meadows are [illegible] into a county by the name of the county of the city of Canterbury. There were subsequent charters, by Henry VII., Henry VIII., James I., Charles II., and George III. The city was divided into six wards, named from each one of the six principal gates, each ward being presided over by two aldermen. The style of the corporate body is that of the mayor and commonalty of the city of Canterbury. Under the new act it has six aldermen and eighteen councillors. Quarter sessions are held by the recorder; and capital offences are removed to the assizes at Maidstone. The city has sent two members to parliament since the 23rd of Edward I. The present parliamentary borough comprises, in addition to the city and its precincts, what is called the borough of Longport, and parts of some other parishes. The number of acres within the city jurisdiction is 2780, rather more than 1470 have been added to the parliamentary borough. The division of the city, under the authority of the Municipal Act, is into three wards only, Westgate, Dane John, and North Gate. Canterbury has the advantage of a regular post, good markets, and excellent inns. There are two banking houses in high credit. The neighbourhood abounds in gentlemen's seats.

From the situation of Canterbury on the main-road from London to the Continent the traffic is large, constant, and profitable. The distance from London by the road is 56 miles, from Sandwich 12, from Ashford 14, from Dover 16, and from Folkstone and Deal 17. The markets are daily for provisions of all kinds; but the principal one, which is for cattle, corn, hops, and seeds, is holden on Saturday, and is toll free for corn. A market for fat stock is held every alternate Tuesday with Ashford. The annual fair, which commences on the 11th of October, and lasts from eight to ten days, is very numerously attended; being chiefly for pedlery and toys. The population, according to the census of 1831, is 14,463.

(Somner; Battely; Lambarde; Hasted; Gostling; Camden; *Municipal Corporation Reports*.)

CANTERBURY BELLS, the vulgar name of an annual plant, often cultivated in gardens on account of its large blue or white flowers. It is a native of the mountains in the south and east of Europe, is the Campanula Medium of botanists, and is supposed to have been the Medion of the Greeks.

CANTHA'RIDÆ, a family of coleopterous insects of the section *Trachelides*. Technical characters:—Hooks of all the tarsi cleft; antennæ generally filiform; head usually broader than the thorax, and divided posteriorly by an indentation; thorax for the most part narrower behind than before; elytra soft and flexible, and in most of the species covering the sides of the abdomen. The genus *Cantharis* may be distinguished from other genera of this family by the following characters:—Antennæ long and filiform, the second joint very short; maxillary palpi short, the joints nearly equal, the terminal joint slightly exceeding the others in bulk; head a little wider than the thorax, which is slightly elongated, and has the anterior part suddenly narrowed, forming, as it were, a neck; elytra elongate, and somewhat linear.

Cantharis vesicatoria, the *Spanish fly*, or *blister-beetle*, is well known for its medical uses. It is about three quarters of an inch in length, and of a bright green colour; the legs and antennæ are bluish black.

This insect is found but rarely in this country. It appears in the month of June, and frequents ash trees, upon the leaves of which it feeds. *C. vesicatoria* is also found in France, but in Italy and Spain it appears to be most abundant.

When touched these insects feign death, and emit an odour of a highly penetrating nature. Their larvæ live in the ground, and feed upon the roots of plants.

CA'NTHARIS OFFICINA'LIS (Geoffroy); Meloe vesicatorius (Linnæus); Lytta vesicatoria (Fabr.); is extensively employed to produce blisters. The volatile principle which is exhaled by the living insect is so pungent as to cause great inconvenience to those who approach the trees where they alight. They are generally collected during the morning or evening when somewhat torpid, by persons, whose face and hands are protected by coverings, shaking or beating with poles the trees on which the insects are seated. The most common method of killing them is to expose them to the vapour of hot vinegar: they are then dried on hurdles, and put up for use. Turpentine is said to protect them from the attacks of certain small insects which prey upon particular parts of the dead insects.

Though bearing the name of Spanish blistering flies, the greatest quantity is obtained from St. Petersburg, and the Russian insects are superior to those from Sicily or France. When good, they are of a shining yellowish green colour; the odour is strong, virose, disagreeable, resembling that of mice; taste acrid, caustic, urinous. By drying they lose a great portion of their weight; but age does not greatly lessen their active properties if preserved from damp. The worms or insects which attack them feed only on the inert part, and are only so far injurious that they create a quantity of dust, which is not vesicant; consequently, where worms are present in large proportion, more of the powder must be employed.

Cantharides analyzed by Robiquet yielded :—

1. A green, fluid, oil, insoluble in water, but soluble in alcohol (inert).

2. A black matter, soluble in water, but not in alcohol (inert).

3. A yellow viscid matter, soluble in water, and in alcohol at the common temperature; which has no vesicating power.

4. A white substance, under the form of small crystalline plates: when pure, insoluble in water; but soluble in that liquid when mixed with the yellow matter: soluble in boiling alcohol, from which it is deposited on cooling in crystalline plates: it is also soluble in fixed oils. To this principle the name of cantharadin has been given: many consider it a kind of animal camphor. It is the vesicating principle of the insect.

5. Another fatty matter, insoluble in alcohol (inert).

6. Phosphate of lime } in the skeleton.
7. ,, magnesia }

8. A small portion of free acetic acid.

9. A still larger portion of free uric acid.

Possibly other principles exist in them. The odour is due to a volatile oil, which is very pungent, and when it reaches the eyes causes severe ophthalmia.

Cantharadin may be extracted in various ways; but where it is desired for practical purposes to employ cantharadin apart from the other constituents of the fly, turpentine, at the temperature of 212° of Fahr., allowed to stand upon a number of the powdered flies, especially the large female flies, will extract it; and the terebinthinate solution may be used as a most efficacious vesicant. Cantharadin is so powerful, that one-hundredth part of a gram applied to the skin will excite vesication. Cantharides are employed both externally and internally; but even when applied externally, should their active principles be absorbed, the same effect will be produced as if taken by the mouth. Applied to the skin, in moderate quantity, the only effect is rubefaction of the part, followed in general by vesicles or blisters, and the secondary effects of counter-irritants on the system at large. Should any of it be absorbed, a specific effect will be exerted on the urino-genital organs, precisely as if administered by the mouth. If a very large quantity be absorbed or introduced into the system by the mouth or any other channel, such as injection by a vein, a powerful and often dangerous degree of action is exerted on the cerebro-spinal system, giving rise to violent nervous symptoms. The quantity which acts as a poisonous dose varies greatly in different individuals. This difference of degree of action is referable to idiosyncrasy; and while one individual has been sensibly affected by merely smelling the powder, six ounces of the tincture have been taken by another without injury. It is a medicine which requires the utmost circumspection in its administration. Even the process of powdering it should be carried on in such a way as to secure the operator from either inhaling any of the floating particles, or from receiving the volatile principle in his eyes. For internal administration, a solution in alcohol or æther is preferable to the powder, as it can be more perfectly incorporated with any fluid vehicle, and prevented from remaining in contact with the mouth or palate. The cases in which its internal exhibition is necessary or justifiable are very few. In some cases of atony of the bladder its use may be allowed; but it is productive of no benefit in diabetes, and should be avoided. Externally cantharides may be employed in various forms for different purposes, to act as a local stimulant to cause rubefaction, to produce vesicles and a discharge of fluid, or simply for their secondary effects, which may be either stimulant or sedative, according to circumstances. As a local stimulant tincture of cantharides is very useful in the languid circulation of the extremities which leads to the formation of chilblains. Cantharides appear to act primarily on the nerves of the part to which they are applied, and afterwards on the vessels. In certain conditions of the nervous system such as occur in apoplexy and palsy, they do not cause vesicles to arise. To produce a rubefacient action, either a mixture of the tincture with some oleaginous fluid may be applied, or the common blistering plaster may be laid upon the part, and both removed before vesication has occurred. This limited application of so potent an agent is often useful, and in some instances all that can with safety be employed. In the inflammatory complaints of young children or feeble persons, it is necessary to remove the applied substance before vesicles form; otherwise troublesome ulcers and occasionally gangrene ensue: this is particularly apt to follow when measles have preceded the application of a blister. Sometimes the discharge of the serum is as exhausting as blood-letting: and must be avoided by the above precaution. To quiet the irritability of the nervous system of old people, accompanied with restlessness, fidgetiness, and discontent, nothing is more effectual than this limited application of cantharides to the nape of the neck. In many chronic cutaneous diseases, especially of the squamous or scaly, and even of the pustular kind, the repeated application of blisters kept on only for a short period is very advantageous. Nothing will so soon cure (along with proper internal treatment, and attention to diet and regimen) ring-worm of the scalp, as blisters applied alternately with poultices, followed by creosote, so soon as the inflammatory stage is removed. As a general rule, blisters, or the employment of cantharides in any way, are not proper at the commencement of any inflammatory complaint. But after the stage of great vascular excitement is over, and when a failure of the vessels of the parts is likely to take place, blisters are of unquestionable service. Also when diseases are assuming the chronic form, blisters have great power in preventing this, or removing it when it has actually occurred. In deep-seated diseases of the joints or bones, the frequent repetition of small blisters in the neighbourhood of the part is of much utility. They are also of great use in relieving pain of the chest in the latter stages of phthisis pulmonalis.

In case of an overdose, it is more easy to say what should not, than what should be done. If vomiting has begun, it is to be encouraged, and should be caused where it has not commenced, in order to remove the substance from the stomach, but the stomach-pump is inadmissible, owing to the state of the throat and pharynx. Oily fluids are hurtful, and even warm water is bad. Venesection may be necessary, but the state of the nervous system is to be kept in view, and the excitement, if any, moderated, or if there be lethargy, the person is to be roused. Camphor is of little use in allaying the strangury, hæmaturia, and other signs of over-action of the kidneys: opiate enemata are most useful against these symptoms.

Several other insects contain cantharadin, such as the *Meloe proscarabæus*, the *Mylabris cichorii*, the *Coccinella septempunctata*, &c. These or others are used in different parts of the world to produce vesications, especially the *Cantharis vittata*, or potato-fly, and *C. atrata*, both in North America; *C. ruficeps*, in Sumatra and Java; *C. gigas* and *C. violacea*, in the East Indies; *C. atomaria*, in the Brazils; *C. Syriaca*, in Arabia; *Meloe majalis*, *M. proscarabæus*, and *Mylabris cichorei*, in China and East Indies; *M. pustulata*, Cape of Good Hope, used in China; *Lydus trimaculatus*, in the north of Europe.

CANTICLES. [SOLOMON'S SONG.]

CANTILEVER, or bracket, a projecting piece of wood, stone, or iron, which supports a cornice, balcony, &c. It may be considered in principle similar to the modillion of the Corinthian order, but it bears no resemblance to it in proportion or enrichment. Cantilevers are usually long and narrow, and placed at wide distances apart, as in a balcony, where they are usually wide enough to receive the ends of the slabs of stone which form the floors of the balcony. [BALCONY.]

CANTO FERMO, or CANTUS FIRMUS, in music. [PLAIN-CHANT.]

CANTON, a city of China, the capital of the province called Kuang-tong, a corruption of which has been applied by Europeans to the town itself: the real name is chow-foo. It lies in 23° 7′ 10″ N. lat., and 113°

14′ 30″ E. long., and is built on the Chookeang, a river which flows from the mountains N. and W. of the city. From the entrance of the river (called after the Portuguese Bocca Tigris) to Canton the distance is 32 miles; a ship sails a few points W. of N. until she arrives near the 'first bar,' and thence her course is nearly due W. to the anchorage at Whampoa, which is 10 miles below the foreign factories, the intercourse with which is entirely conducted in boats. On reaching the city the country to the N. and E. appears hilly and mountainous. The rivers and creeks, which are very numerous, abound with fish, and are covered with a great variety of boats, which are continually passing between the neighbouring towns and villages. S. of the city the country consists of an alluvial flat, being the delta formed by the depositions from the waters of the main river, with here and there a solitary hill of granite or red sandstone rising up like an island. Rice-fields and gardens, in a high state of cultivation, occupy the low lands, and trees, principally firs, cover the elevated points. That part of the city situated within the wall is built in the form of an irregular square, and divided by another wall, which runs from E. to W., into two parts. The N. and largest portion is called the old city; the S. part is called the new city. The whole circuit of the two together has been perambulated with ease in two hours, and may therefore be about six or seven miles. To the S. the wall runs parallel to the river at the distance of fifteen or twenty rods; on the N., where the city is built partly up the acclivity of the hills in the rear, the wall takes an irregular course, and it may be as much as 300 feet above the surface of the river.

The walls are composed of brick, with a foundation of coarse red sandstone, and vary in height from 20 to 30 feet. The gates of the city are 16 in all, but four of them lead through the wall which separates the old from the new city, so that there are only 12 outer gates, each distinguished by a name descriptive of its position. The suburbs resemble, in respect to their streets and buildings, the city within the wall, which is prohibited to and has seldom been entered by Europeans. Most of the streets are short, and irregularly laid out, varying in width [illegible] to 16 feet: in general they are about [illegible] of the passage of two sedan [illegible]es are used at Canton. They [illegible] flag[illegible] or less regularly, with [illegible]d that throngs them is exceed[illegible]y great [illegible] din of each day the stout ha[illegible] sed vociferation [illegible] carrying every description of goods, and mingled with the bearers of sedans and [illegible] foot [illegible] man [illegible] up in noise and bustle for the [illegible] of [illegible] carriages.

Near and upon the river the houses are built on wooden piles, which render the foundations sufficiently s[illegible]. Bricks are generally used for the walls of houses, though a few of the poorer sort are constructed of mud. Stone and wood are sparingly used in building, the first is employed about gateways, and the second for columns, beams and rafters. The roofing consists invariably of thin tiles, which are laid on [illegible] as alternately concave and convex, the latter overlapping the joined edges of the former and cemented over them with mortar. Windows are small and [illegible] supplied with glass, paper, mica, or the interior laminæ of oyster shells, are used in its place. Hardly any iron, a comparatively expensive substance, is employed about buildings. The materials for building are procurable at moderate prices and in abundance. The wood, a variety of fir, is floated down the river in huge rafts, bricks are made in the neighbourhood of Canton, and brought thither in boats, being sold from four to eight dollars a thousand.

The poorest persons live in the extreme parts of the suburbs, along the banks of the river and its creeks, and in the N. part of the old city: their houses are mere mud-hovels, low, narrow, dark, and without any division of apartments. In habitations a little more spacious and cleanly than these about one-half of the population of Canton have their abodes. They stand close on the street, and have usually but a single entrance, which is closed by a bamboo screen suspended from the top of the door: within these houses there are no superfluous apartments: a single room allotted to each branch of the family serves as a dormitory, while a third, which completes the number into which the whole inclosure is divided, is used by all the household as a common eating-room. Chinese houses of consequence open towards the S., but in the poorer sort this point must of course be often disregarded. The dwellings inhabited by the more wealthy part of the community are surrounded by a wall 12 or 14 feet high, that fronts the street, and completely screens the buildings within. The prospect along the narrow streets lined with these bare walls is very cheerless. The outer inclosure is entered through a large folding-door (with a small one on each side of it) into an open court, within which is a visitors' waiting-room, furnished with chairs and small tables by their side. Here the guest is met and conducted into the principal hall, a spacious apartment ornamented with carved work, varnished and gilded, and hung with scrolls covered with fine writing, or representations of birds, flowers, landscapes, &c. The remaining part of the inclosure is occupied by the domestic apartments and a garden or yard.

The portion of Canton in which the European factories are situated, being a mere suburb, does not contain many of the larger or public buildings, but the arrangement and architecture of the streets and shops are precisely the same as within the walls of the city. The shops are commonly quite open towards the street, that is, those appropriated to Chinese customers; for the few streets devoted to European trade are rather on a different plan, the shops being of a closer structure and less exposed to external observation. The several streets are commonly devoted to distinct trades. There is *Carpenter* Street, or rather Square, as it is carried round a parallelogram; *Curiosity* Street (as the English call it) is devoted to the sale of antiques, real and fictitious; and *Apothecary* Street is full of druggists' shops, the drawers in which are neatly arranged and lettered, but filled principally with simples. By the side of each shop is suspended from on high a huge ornamental tablet of wood, varnished and gilded, on which are inscribed the particular calling of the tenant and the goods in which he deals. Either the police must be very good or the populace tolerably abstemious; for some of the shops, which are pretty richly supplied, appear to be much exposed towards the street; but the inhabitants of each division generally combine into a system of watch and ward for common protection, and during the night the streets are closed at each end by doors, which are guarded by the regular police. The greatest risk to which the houses and shops of Canton are exposed is that of fires, which in frequent instances are not the result of mere accident. The Chinese have very generally adopted the use of our engines, which they themselves manufacture sufficiently well to answer the purpose. The foolish notion of fatalism which prevails among the people makes them singularly careless as regards fire, and the frequent recurrence of accidents has no effect upon them, although the conflagration in 1822 went far to destroy the whole city. Vagabonds and beggars are very numerous in Canton. There is no levy of rates for the poor, but there are some small charitable institutions, which are few in number and small in extent. The amount of the native population of this city has been often estimated, but so little authentic information has ever been obtained on the subject, that it still remains a question wholly undecided. The [illegible] calculation by which some have endeavoured to make it amount to a million does not seem to deserve much credit. As the circuit of the city does not exceed six or seven miles, and as the houses are not more than a single story in height, it seems difficult to imagine how such a number as a million can be contained within its precincts.

Under all the circumstances the climate is remarkably healthy, though extremely hot during the summer, and at all times subject to great and sudden vicissitudes. In July and August the thermometer sometimes reaches 100° of Fahrenheit in the shade, and during winter it occasionally falls below the freezing point at night: the average of the year is about 72°. No inconsiderable part of the population lives upon the river, in the junks, barges, and small boats: a very large majority of the latter are called 'egg-house' boats, from their shape resembling the longitudinal section of an egg. They are generally not more than 10 or 12 feet long, about 6 broad, and so low that a person can scarcely stand up in them. Their covering consists of a bamboo or mat tilt, shaped like that of a waggon, which is very light, and serves tolerably as a defence against the weather. Whole families live in these boats, and are considered as a distinct part of the population, being under a separate regulation and not allowed to intermarry with those on shore.

It may perhaps seem incredible that the whole frontage of the buildings in which foreigners of all nations are shut up together for the prosecution of their trading business at Canton does not exceed between seven and eight hundred feet. Each front, of which there are about thirteen, extends backwards a hundred and thirty yards into a long narrow lane, on each side of which, as well as over arches that cross it, are the confined abodes of the English, French, Dutch, Americans, Parsees, and others. Many years back a considerable number of flags, as the Danish, Swedish, and Austrian, were hoisted in front of the factories, besides the English, Dutch, and American; but for the last quarter of a century these three, with the French tri-colour, which was erected soon after the revolution of 1830, have been the only foreign ensigns seen there. At present neither the English nor American flags are hoisted.

The European factories are called by the Chinese 'the thirteen *Hongs*,' the word hong being always used by them to denote a commercial establishment or warehouse; according to their custom, each factory is distinguished either by some appellation denoting wealth and prosperity, or by the name of its flag. Thus the Austrian factory was called the 'twin Eagle Hong,' a name which it retains to this day; the Danish, the 'yellow flag Hong;' the Company's, 'the Hong that ensures tranquillity;' the American, 'the Hong of extensive fountains;' and so on. To the east of all there is a narrow inlet from the river a fetid ditch, which serves to surround a portion of the city wall, as well as to drain that portion of the town. This is crossed with a single arch by a narrow street at the back of the factories, that leads to the warehouses of the several Hong merchants, all of them communicating with the river by wooden stairs, from which the tea and other goods are shipped. The space occupied by the foreign factories is crossed by two well known thoroughfares, one of them named China Street, and the other Hog Lane; to which a third, called New China Street, has been lately added. The first is rather broader than the generality of Chinese streets, and contains the shops of the small dealers in carved and lackered ware, silks, and other articles in common demand by strangers. The shops, instead of being set out with the showy and sometimes expensive front of an English or French shop, are closed in by gloomy black shutters, and very ill lit by a small sky light, or rather a hole in the roof. The alley called Hog Lane is more narrow and filthy than any thing of the kind in a European town. The hovels by which it is lined are occupied by abandoned Chinese, who supply the poor ignorant sailors with spirits, medicated to their taste with stimulating or stupifying drugs: and when the wretched men have been rendered nearly insensible by these poisonous liquors, they are frequently set upon by their wily seducers, and robbed as well as beaten. It was here that the affrays, which many years ago so frequently led to homicides and consequent discussions with the government, in general originated, until the Company's authorities invested the senior commander of the fleet with the complete regulation and control of all boats, with their crews, at Canton. Powerful influence was at the same time used to put down the spirit-shops, or bind their owners by heavy penalties to good behaviour.

As Canton derives its chief interest and importance from being the sole emporium of the British trade with China, it becomes necessary to take some particular notice of this. The city and port to which it has been so long restricted (in fact ever since the present Tartar rulers possessed themselves of the empire) is nearly at the farthest possible distance from the capital. Two circumstances concur to render Canton the point most unsuited to promote the importation and consumption of British goods: these are, the comparative heat of the climate, and the difficulties of transport, arising not only from the distance, but from the upward navigation against two rapid streams from the west and north, and the crossing of high mountain ridges whence those streams derive their source. The policy of the Tartar dynasty in confining the European trade with such obstinacy to a point so unsuited to its extension may be explained on two grounds: first, the desire to remove the danger of external involvements from the vicinity of the capital: secondly, to derive the largest possible revenue from internal duties on transit, which in this instance are known to be large.

The direct annual revenue accruing from Canton to the emperor has amounted to about 1,200,000 taëls (nearly half a million sterling) on imports; but this bears no proportion to the indirect gains accruing to Pekin, or to the provincial government, from various contributions exacted from the Hong merchants under various names and pretexts. On a late occasion, it is well known that the expenses of quelling a rebellion in the north-west of the province were defrayed by the Hong merchants; the senior merchant having contributed 100,000 taëls. The Consoo fund, presently to be explained, is a rich source of revenue to the Chinese, and a proportionately heavy burthen on our trade. The fiscal and custom-offices of Canton being nearly all of them farmed out, are also maintained by charges on the European commerce. As the Consoo fund owed its origin to the peculiar constitution of that body of monopolists called Hong merchants, it may be as well to premise that this corporation and its privileges are founded as much in the peculiar policy of the government as in the cupidity of the individuals who have composed it. The pride and jealousy of the rulers of the country have kept them studiously aloof from a direct intercourse with foreigners, and they find it most convenient to throw the trouble and responsibility of managing Europeans on inferior delegates, and to practise their impositions through that intermediate channel. The Hongs consist at present of eleven individuals of very different degrees of wealth and character, some of the richest of whom have personally withdrawn from the trade since it was laid open to private shipping, but lend their capital to the active traders, without sharing their responsibility. The Hong merchants do not form a joint stock company, but are licensed to trade individually: although the whole body was, until the year 1830, liable for all the foreign debts of each member. It was then found that such a responsibility on the part of the body had given to the poorer members a degree of credit, and a facility in obtaining loans from Europeans, which had been the principal cause of the numerous bankruptcies, either real or fraudulent, among the indigent or improvident Hongs. In 1828 and 1829 two of them failed to the aggregate amount of about 2,000,000 dollars, but the whole was liquidated in the course of six years, and the last instalment paid at the commencement of 1834. The fund from whence such large sums have been drawn is derived from charges, amounting to about three per cent., laid by the Consoo on foreign exports and imports, and it must therefore be a heavy burthen on the foreign trade. Instead of being allowed to terminate with the final payment of the European debts, there is every reason to be certain that these charges continue in full force, and serve to meet the vast demands made on the Consoo by the government. Under these circumstances, there can be no room for surprise at the pertinacity with which the government supports a monopoly so profitable and convenient to itself, by the medium of which it can fatten at the expense of Europeans, without coming into direct collision with a race who are not disposed to accord those acts of deference and homage so grateful to its vain and despotic spirit.

The *Chang heang*, 'true or imperial duties,' constitute the first item of Canton charges in order of payment, but are in fact only a small part of the whole. Notwithstanding the care with which both the government and the Hong merchants endeavour to conceal these mysteries from Europeans, a correct view of the above duties on imports has long since been obtained from the Custom-house books.

The second item is called *Kea-san*, 'add three,' being an addition of three in ten, or about thirty per cent. on all fixed duties. It is nominally a charge for changing dollar silver into sycee of the imperial standard, but greatly exceeds the real difference, and the surplus is supposed to be pocketed by the hoppo and his delegates.

A third item consists of a weighing charge on the pecul of 133 lbs., levied on all articles (even piece-goods) by *weight*, and forming a considerable addition to the regular duty.

The following is a summary view of the pilotage, port-charges, and other demands on European shipping entering Canton:—On nearing the coast from the southward, the Ladrones, two islands, called by the Chinese *Low-Mân-Shan*, are first made. A point lying S.E. of Macao, called Cabrita by the Portuguese, is then passed, and off it there is an exposed anchorage of four to three fathoms. Here ships send their boat ashore to Macao for a Chinese pilot, who is not often procured until the next morning; and when the weather is bad, ships run up at once to Lintin for shelter. The charts constructed from Ross's surveys afford ample directions for piloting a ship to Whampoa, and the pilots are only fishermen employed by those who take out a government license to act. The pilot's fee inward is sixty dollars, and the same outward. On anchoring at Whampoa, nine or ten miles from Canton, two boats from the offices of the local authorities fasten on astern of each ship. A compradór or purveyor of provisions is generally hired, but a fee of fifty dollars is in any case paid, to meet the extortions of the Mandarins. A person called a linguist [illegible] his from each ship. Five or six of these men a [illegible] by the government, and held responsible for the proceedings regarding the cargoes of European vessels.

Some time after reaching Whampoa, each ship is measured by the hoppo's officers, for the levying of the port-charge. What is called the *cumsha*, or present, is 1600 taëls on all vessels alike; but the measurement is charged at three different rates, according to the size of the ships, being calculated on the product arising from multiplying the length between the mizen and foremast by the breadth at the gangway.

	Dollars
The measurement on a ship of about 850 tons will be	2363
Present, on all ships alike	2223
Pilotage in and out	120
Small charges connected with pilotage	30
Linguist's fee	173
Compeador's fee	50
Total	4959

It is clear that these heavy imposts must hold out the strongest inducements to all ships, especially small ones, to evade them if possible; and to this circumstance, joined to the contraband nature of the opium trade, is to be ascribed the rapid growth of the smuggling depôt at Lintin, which commenced about the year 1822. As if to give an additional impulse to the increase of this smuggling station, the Chinese government, in 1825, in consequence of the scarcity of rice, enacted that ships bringing rice and no other goods, should be exempt from the measurement and cumsha charges at Whampoa. Ships now station themselves at Lintin, laden with rice, which they sell in sufficient quantities, to vessels newly arrived, to exempt them from the port charges; the foreign imports being either left at Lintin to be smuggled in, or put on board other ships which fill up entirely on freight for Whampoa. By gradual abuse, however, even rice-ships have become subject at Whampoa to various irregular charges, amounting in all to about 900 dollars.

The Canton government begins to betray serious alarm at the increase of the smuggling system at Lintin, and this alarm is no doubt founded, first, in the evils arising from the lawless, independent, and violent habits which such a system engenders, and secondly, in the prospect of a decrease or annihilation of the revenue derived from the fair trade. A Chinese was shot on board a government boat at Lintin in 1827, another in 1831, and a village at Kumsingmoon (near Lintin) was attacked from the smuggling ships in 1832, on which occasion a Chinese was killed, but a Lascar at the same time was captured and put to death. As the vessels employed in the trade grow smaller and more numerous, these evils, unless remedied, may be expected to increase, until smuggling degenerates into piracy.

Some observations may here be introduced in regard to the prospect of opening a smuggling trade for British manufactures along the coasts of China E.N.E. of Canton. The late Dr. Morrison observed, as far back as 1823, 'The opening of any ports to the north for the resort of European ships is not a likely occurrence while the present rulers of China reign. They will not even allow tea to be carried coastwise to the south from the ports in Chĕkeung province, lest the traders should carry their cargoes to European ships or ports, and so deprive government of the revenue arising from the inland carriage; but most of all, lest a traitorous intercourse with Europeans should be opened, and the tea get to the possession of the English without passing through the Canton custom-house.' This is strictly true at present, and has been daily confirmed by the experience of the vessels that have attempted to trade on the coast, where nothing succeeds as an import save opium.

In the experimental voyage of the Amherst, only a very small assortment of goods of various kinds was carried up, the object not being profit, but a mere trial. Even of this small quantity, the greater proportion was brought back to Canton unsold, though offered at any price, at a great number of places, during a voyage of six months. The conductors of the voyage admitted, in their report, that as a commercial speculation it must be considered to have failed; and the loss amounted to between five and six thousand pounds.

Experimental voyages were soon after made by individuals in imitation of the company. A vessel called the Jamesina sold some opium, and proceeded as far as Foochowfoo. The supercargo in vain sought to be allowed to trade; his views were frustrated by the vigilance of the government. He observed, on his return, 'My mind is made up, that until some important change in the relations of the two countries takes place, the only chance of pushing English manufactures on this coast is by leaving them a small item in an opium cargo.' The Sylph, another vessel, proceeded up to the Yellow Sea, and even touched on the coast of Tartary, but her endeavours to trade were generally fruitless.

A gentleman, sent by the government of Bengal to procure black and green tea plants from the neighbourhood of the provinces where they are cultivated, saw a great deal of the attempts to trade on the coast. He was of opinion that, without the consent of the Chinese government, any prospect of an advantageous or creditable intercourse did not exist.

Up to the 1st January, 1834, the number of British shipping entering Canton and Lintin (including the Company's trade), was upwards of 80 vessels annually, the aggregate burthen of which was about 60,000 tons. Of the whole value of the *imports*, opium constitutes at least one-half in amount; the remaining moiety consisting principally of raw cotton from India, and of woollens, cotton goods, and metals from England. Of the *exports*, tea has constituted nearly one-half the total value; the remainder consisting of raw silk and miscellaneous goods.

The following table exhibits a summary of the amount of British and Indian imports, in Spanish dollars, during the last five years of the Company's charter:—

East India Company	Private Account (Company's ?)			
Cottons, Woollens, and Metals	Cotton Wool.	Opium.	Sundries.	Total Value.
Dollars.	Dollars.	Dollars		Dollars.
4,484 2[illegible]6	3,335,760	13,464,924	1,642,462	22,931,372
4,514,112	3,694,716	11,121,512	1,799,029	20,739,369
3,687,674	3,849,935	11,304,018	1,701,600	20,536,297
4,039,258	4,048,132	12,185,100	2,032,763	22,304,753
4,357,653	4,881,407	11,618	2,616,017	23,476,793

The value of exports from Canton in British ships, during the last five years of the Company's charter, is shown in the following table:—

Season.	East India Company.	Private Account, including Officers of Company's Ships.		Total Value.
	Tea.		Sundries	
	Dollars.	Dollars.	Dollars.	Dollars.
1829-30	7,848,104	706,092	12,703,061	21,257,257
1830-31	9,935,858	673,740	9,262,653	19,872,251
1831-32	9,214,238	757,625	7,795,623	17,767,486
1832-33	9,633,210	795,861	7,904,189	18,3[illegible]60
1833-34	8,089,163	1,044,586	11,309,521	20,445,270

Tea.—The bulk of the Company's exportations down to the end of 1833, comprised, under the head of black teas, bohea, congo, with souchong and campoi, under which may be ranged the less considerable varieties of souchi and pekoe. The green teas consisted of the three principal distinctions of twankay, hyson skin, and hyson. The following is an abstract of the teas exported to England on account of the East India Company during the four last years of their charter, showing the different kinds:—

SEASON.	BLACK.						GREEN.					
	Bohea.		Congo.		Souchong and Campoi.		Twankay.		Hyson Skin.		Hyson.	
	Chests.	Peculs.	Chests.	Peculs.	Chests.	Peculs.	Chests.	Peculs.	Chests	Peculs.	Chests.	Peculs.
1830-31	60,691	39,347	216,380	136,700	4838	2888	54,711	32,856	2410	1184	20,762	10,271
1831-32	69,490	54,367	202,742	129,106	3572	2184	47,919	30,833	2415	1181	17,707	8850
1832-33	70,503	53,862	217,956	137,312	3867	2320	37,136	22,281	1595	786	13,282	6641
1833-34	84,835	62,487	171,571	109,176	5507	3370	48,190	29,781	1647	812	13,587	6739

As it is a question of importance how far a sudden increase in the demand for tea is calculated to injure its general quality, and to what extent factitious teas may be expected to be offered at Canton, the following information may be subjoined.

The remission of the tea duties in the United States occasioned, in the years 1832 and 1833, a demand for green teas at Canton which could not be supplied by the arrivals from the north-east. The Americans, however, were obliged to sail with cargoes of green tea within the season, and large prices were offered for the article. In consequence of some rumours which had reached him, an English gentleman prevailed on one of the Hong merchants with great difficulty to conduct him across the river to a place where they were *manufacturing green teas from damaged black leaves.* One of the tea inspectors attended, and they were witnesses to the following process.

In the first place, large quantities of black tea, which had been damaged in consequence of the floods of the previous autumn, were being dried in baskets with sieve-bottoms placed over pans of charcoal. The dried tea was then transferred, in quantities of a few pounds each, to a great number of cast-iron pans, imbedded in chunam over furnaces. At each pan stood a workman stirring the tea rapidly round with his hand (to prevent burning), with the addition of a very small quantity of finely powdered turmeric. This of course gave the tea a yellow tinge; but it was to be made green. For this purpose, some lumps of a fine dark blue were produced, together with a white powder, which, from the names given them by the workmen, as well as their appearance, were known to be Prussian blue and gypsum, or prussiate of iron and sulphate of lime. These two were triturated finely together with a pestle, to reduce the dark colour of the blue to a light shade, and a small tea-spoonful of the powder being added to a few pounds of the yellow leaves, they were stirred round as before until the tea had taken the fine bloom colour of hyson, with a corresponding smell. To prevent all possibility of error, some samples of all the ingredients, together with the tea in its several stages, were carried away, and subsequently examined.

The tea thus coloured was handed in small quantities, on broad shallow baskets, to a number of women and children, who carefully picked out the stalks and coarse or ill-coloured leaves; and this being done it was passed in succession through sieves of different degrees of fineness. The first sifting produced what was sold as hyson skin, and the last as young hyson. As the party did not see the intermediate step between picking and sifting, there was reason to believe that the size of its leaves was first reduced by chopping or cutting with shears. If the tea has not highly deleterious effects, it can only be in consequence of the colouring matter existing in a very small proportion to the leaf. On attempting to enter several other houses where the same process was going on, the doors were suddenly closed upon the party.

This however was not the only effect of the suddenly increased demand for teas. The greater portion of the ankoi teas, under the denomination of caper, orange pekoe, and ankoi congo, were in the second year mixed with spurious leaves. These were of several kinds, but appeared generally to be largish leaves cut up. The two most common were a thick, soft, dark green leaf, very smooth, and a palish hairy leaf, with the veins strongly marked. The former is not detected easily, and only by inspecting the leaves after infusion, as it imparts no bad smell to the tea, and is hardly perceptible even to the taste: the latter is easily discovered by giving to the tea that smell and taste usually known in England by the terms 'faint and odd.'

American Trade, &c.—Next to the British trade the most considerable in tonnage and value has been that of the Americans; while the first however has progressed steadily to its actual amount, the latter has been subject to very great variations. The remission of the tea duties in America gave it in 1832-3 a sudden stimulus, and the exports and imports at Canton during that season each of them exceeded 8,000,000 dollars, on board of nearly 50 vessels. In consequence of the losses sustained on the teas the American tonnage in 1834 was greatly reduced, and will probably not very soon reach its previous amount.

Both the French and the Dutch trade with Canton seem to have a tendency to increase. There have lately been three or four French ships in port, where it was formerly unusual to see one: and in 1832, 17 Dutch vessels visited China from Holland or Java.

Money and Weights. There is at present no paper currency in China, although it was adopted by the Mongol conquerors of the empire, and subsequently abandoned in consequence of the depreciation and discredit which ensued from over issues and the bad faith of the government. The circumstances are stated very distinctly in the travels of the Arab, Ibn Batuta. 'When the paper was torn or worn out,' he observes, 'it was taken to the treasury, and supplied by new, marked with the government stamp. The profit arising from the circulation accrued to the sovereign.' 'They did not buy or sell with the dirhem or dinar,' it is added, 'for should any one get these coins into his possession he would melt them down immediately.' This was the natural consequence of a depreciated paper currency. At Canton silver and a base alloy of copper are the two metals in circulation. The native copper coin is, from its low value, used only in bazaar payments, the exchange varying between 700 and 800 for a Spanish dollar. The Chinese seem to find it impossible to have a silver coin, from the propensity of the people to play tricks with any thing more valuable than their base copper money. The Spanish dollars imported into Canton are very soon punched into such a state as to be exchangeable only by weight. They even introduce bits of lead into the punch-holes, and none but freshly imported dollars are ever received without a very strict scrutiny, called shroffing. The charge attendant on this operation causes a premium in favour of new dollars to the extent of one or more per cent.

The broken Spanish dollars circulate by weight, and their proportion to the tale, or tael, varies in different transactions, being estimated, in the *accounts* among foreigners and native merchants, at the rate of 720 tales per 1000 dollars; but in the weighing of money, at 717 tales per 1000 dollars; and to 'outside dealers,' shopkeepers, and compradors, at 715 per 1000.

The Chinese money weights are as follows:—

Tale	Mace.	Candareen.	Cash.	Oz. Troy.	Gr. Troy.
1	10	100	1000	1·208	579·84
	1	10	100		57·98
		1	10		5·79

In the sycee, or fine silver, prescribed for the payment of government dues, 98 parts in 100 must be pure. This is cast in oblong ingots, of one and 10 tales in weight, with a stamp impressed. A large quantity has of late years, from the scarcity of dollars, been received at Lintin in exchange for opium. On being sent home to England it has been found on assay to contain a small quantity of gold, and has accordingly proved an advantageous remittance to London and Calcutta. It now bears a premium at Lintin of [illegible] per cent., and is procured with great difficulty at that. Gold is not used either as a medium of exchange or as an article of remittance. The present value of the finest is [illegible] dollars per tale weight.

The commercial weights are calculated in peculs, catties and tales, and their proportions are according to this table:

Pecul.	Catties.	Tales.	lbs. avoirdupois	Cwts.
1	100	1600	133⅓	1·19047
	1	16	1⅓	

(*A Description of the City of Canton; The Chinese, a general Description of the Empire of China and its Inhabitants.*)

CANTON, JOHN, was [illegible] at Stroud July 31, 1718. Some advances made by him in mathematics and experimental philosophy induced his father to send him to London in 1737. He then articled himself for five years to the master of a school, with whom he afterwards went into partnership and in this profession he spent his life.

On the invention of the Leyden phial he turned his attention particularly to electricity, and various discoveries of his not sufficiently marked to require biographical notice, though evincing great ingenuity, will be found in the references at the end of this article. He was the first who in England verified Dr Franklin's idea of the similarity of lightning and electric fluid (July, 1752). He was then a member of the Council of the Royal Society, of which, in 1751, he received the gold medal for his method of making artificial magnets. [MAGNET.] In a paper communicated in 1753 he announced the discovery (which Franklin made about the same time) of clouds being in different states of electricity. In the following year he found that the quality of the electrical excitement made by rubbing any given substance depended on the rubber, as well as on the other substance. The common pith-ball electrometer, and the amalgam of tin and mercury used for the increase of the action of the rubber, are due to him. In 1762 he demonstrated the compressibility of water, in opposition to the well-known Florentine experiment. His experiment was repeated in the presence of a committee of the Royal Society, and a second gold medal was awarded to him in 1765. In 1769 he communicated experiments in proof that the luminous appearance of the sea arises from the presence of decomposed animal matter. He died March 22, 1772. There is a life of him by his son in Kippis's Biographia Britannica, abridged in Hutton's mathematical dictionary. His [illegible] municated some new experiments for Priestley's Histories of Electrical and Optical Discoveries.

CANTON'S PHOSPHORUS. [PHOSPHORUS.]

CANUTE. The rich, fertile, and beautiful island of Britain was a constant temptation to the inhabitants of the shores of the Baltic, and of the less genial country stretching thence to the north, forming the kingdoms of Norway and Sweden. These people, the Northmen as they were designated by the people of the more southern parts of Europe, possessed a navy which seems to have been far superior to that of any other state, and which enabled them to make at pleasure descents upon the coasts of all the countries bordering on the English seas. But it was not merely by predatory descents upon the coast that they harassed the English people during the reigns of the Saxon kings, but [illegible] es in the field, and disputed with the native princes the entire sovereignty of the southern portion of the island. They had possessed themselves [illegible] right of conquest of much of the northern coast of France, where they had a succession of princes, who became at length, in the person of William the Normen (northmen), sovereigns of England.

Much of the history of the Anglo-Saxon kings is the history of th [illegible] tests with these formidable neighbours. The genius [illegible] mu [illegible] talents of Alfred for a while saved the country [illegible] s; but when he was dead, and was suc [illegible] y a [illegible] princes inferior to himself, the nation [illegible] ss able [illegible] ke an effectual resistance [illegible] Danes became settled in many portions of the island, tribute was paid to them, and finally, in the person of Canute, one of the greatest m [illegible] of this northern sovereignty, they accomplished that wh [illegible] ey had so long desired, the entire subjugation of the Anglo-Saxon people, and the extinction for a time of the Anglo-Saxon sovereignty.

This then is the light in which we are to contemplate Canute: the king by birth and inheritance of the people now known as Danes, Normans, and Swedes, and as the man who accomplished the work of his father Sweyn in displacing the posterity of Egbert from the sovereignty of England. He reigned about twenty years (A.D. 1017—A.D. 1036), during which period the country was at peace. England of all his possessions he chose for his usual residence. He died at Shaftesbury, and was interred at Winchester, the usual place of interment of the Saxon kings. Canute, successful in war, was, in peace, humane, gentle and religious. William of Malmesbury says of him, that by his piety, justice, and moderation, he gained the affection of his subjects, and an universal esteem among foreigners. The beautiful little story of the rebuke which he gave to the flattery of his courtiers, a story which it would be an unreasonable scepticism to doubt, found as it is in some of our oldest and best chroniclers, makes his name and his virtue more familiar to the English nation than all the encomiums of our chroniclers, or than his acts of piety in his journey to Rome, and in the foundation of the two monasteries of Saint Bennet of Holme and Saint Edmund's Bury.

The reigns of the two sons of Canute were short and disturbed. In 1041 the posterity of Egbert, in the person of Edward, son of King Ethelred, regained the throne. This was Edward, called the Confessor. His reign was harassed by the Danes under Sweyn, another son of Canute. They also disputed the sovereignty with Harold, the son of Earl Godwin, who assumed the crown on the death of Edward: and England might have suffered much longer from attempts of the northern chiefs, had it not fallen under the sway of the race of Norman princes, who governed with a more vigorous hand than that of the Anglo-Saxon chiefs.

CANZONET', in music (*canzonetta*, Italian, a diminutive of *canzone*, or *canzona*, a song), a short song, one that is brief compared with the sacred airs of the oratorio or with the *arie* of the Italian opera. Formerly the term was applied to vocal music in parts: now it is confined to songs for single voice.

CAOUTCHOUC. This remarkable substance is produced by many different plants. That which comes from the tropical parts of South America is obtained from *Siphonia* (or *Hevea*) *elastica*; and most other euphorbiaceous plants furnish it more or less abundantly. Various Urticaceæ yield it, especially *Ficus elastica*, and the rest of the genera of the Artocarpeous section: *Cecropia peltata* has even been asserted to furnish a large proportion of the American caoutchouc; but this is doubted by Humboldt, because its juice is difficult to inspissate. In Papantla it is yielded by a plant called *Ulé*, which the Berlin botanists call *Castilloa elastica*. Several Apocynaceous plants secrete this matter: as *Urceola elastica*, in Sumatra; a species of *Vahea*, in Madagascar; and *Willughbeia edulis*, in India; but the latter is of bad quality. Among Asclepiadaceous plants *Cynanchum ovalifolium* is asserted by Wallich to afford excellent caoutchouc at Penang.

Caoutchouc is generally termed Indian rubber from its use in removing pencil traces from paper, and sometimes, from its elasticity, gum elastic. In a state of purity this peculiar vegetable secretion is insipid and scentless, white, extremely elastic, inflammable, not altered by exposure to the air, insoluble in water and in alcohol, soluble in æther and in the essential oils, acted upon by alkalies, and decomposed by concentrated sulphuric and nitric acids. According to Dr. Ure's analysis it consists of three atoms of carbon and two of hydrogen; according to Faraday's, of eight atoms carbon and seven hydrogen, or carbon, 6·812, hydrogen, 1·000. When the impure caoutchouc of commerce is burned, a small quantity of ammonia is evolved; it therefore contains also azote.

Caoutchouc was introduced into Europe early in the last century, but its origin was unknown till the visit of the French academicians to South America in 1735. They ascertained that it was the inspissated juice of a Brazilian tree, called by the natives Hhevé; and an account of the discovery was sent to the academy by M. de la Condamine in 1736.

In order to obtain caoutchouc the trees which produce it are pierced in the rainy season, upon which a thick juice of a yellowish-white colour exudes, which becomes darker by exposure to the air. If this juice be kept in well-corked bottles it may be preserved for some time without undergoing much change, and it has been imported in this state; but, however perfectly the atmosphere may be excluded, it will ultimately solidify. Heat coagulates the juice and separates the caoutchouc: alcohol and acids produce the same effect. If exposed to the air in thin films it soon dries, losing from one-third to one-half of its weight, and leaving caoutchouc of the usual appearance. By the natives of South America it is applied in successive coats to the surface of clay models of bottles and of animals, and dried over fires, the smoke of which communicates to it a dark colour. While the caoutchouc is still soft various lines are drawn upon it with a blunt tool, which remain permanently impressed. When the whole has become dry, the clay is crushed and shaken out of the bottles.

The elasticity of caoutchouc is its most remarkable property; pieces of it may be stretched, after being soaked in warm water, to seven or eight times their original length, without being torn, or having their contractile power destroyed; and bottles of it may, by means of a condensing syringe, be expanded to many times their original dimensions. If a bottle be soaked in well washed sulphuric æther until quite soft, it may be inflated by means of the mouth till it has become so thin as to be transparent, and sufficiently light to ascend when filled with hydrogen gas. If dried in this state it will not again contract, and thin sheets of caoutchouc may be thus formed. A bottle has been thus expanded till it was six feet in diameter.

When exposed to heat caoutchouc fuses, but on cooling retains the consistency of tar. At a higher temperature it burns with a white flame and in the countries where it is produced is made into torches, which emit much smoke and an offensive odour. When it is distilled and the vapour condensed, it yields an amber-coloured fluid, which on being again distilled becomes colourless: this fluid has obtained the name of caoutchoucine. It is extremely volatile, it is the lightest fluid known, and produces the heaviest gas known. A small quantity poured into a tall glass vessel speedily evaporates and fills the glass with gas, and as the gas is very heavy it remains in the glass. On applying a light, the surface of the gas takes fire and burns gradually to the bottom of the vessel. These results of distillation are olefiant gas and carburetted hydrogen. Alkali destroy its texture, sulphuric acid decomposes it, and it is converted by nitric acid into oxalic acid. Although insoluble in water, yet, if strips of caoutchouc are wound spirally round a metallic rod, so that the edges are in contact, and then boiled for some hours, the edges will soften a little and adhere, and a tube of caoutchouc will be formed.

In æther caoutchouc readily dissolves, and on the evaporation of the æther it remains unchanged in any of its properties. For this purpose the æther is washed by agitating it in a bottle with twice its bulk of water. The bottle is allowed to remain inverted till the æther has [illegible]ed from the water and risen to the surface, and the water is then allowed to run out, leaving the [illegible] in the vessel. This process is to be repeated three [illegible] times, when about one third of the original quantity of the æther will remain. The caoutchouc is to be boiled in [illegible] a couple of hours, and then placed with the æther [illegible] a well closed vessel, and in the course of a few days it will dissolve completely.

The volatile oils dissolve caoutchouc, but on evaporation generally leave it in a glutinous state; if, however, alcohol be added to its solution in oil of [illegible] the caoutchouc separates in a semi-fluid state, and by exposure to the air regains its firmness and elasticity. Naphtha or petroleum rectified into a colourless liquid dissolves it, and upon evaporation leaves it unchanged.

In South America the natives have long made waterproof boots of caoutchouc, and by imbuing cloth with the milky juice of the hhvé have rendered it impervious to moisture. In Europe caoutchouc is also used extensively in the manufacture of water-proof cloth. For this purpose it is usually dissolved in the oil distilled from gas-tar, and spread upon the surface of a piece of the cloth, upon which a similar piece is then extended, and the whole passed between a pair of rollers. Thus the fabric consists of two pieces of cloth with a layer of caoutchouc interposed, and uniting them together. The cloth thus prepared is so impervious to moisture and to air, that floating or hydrostatic beds for invalids are formed of it, and even beds and cushions are rendered elastic by inflating them.

Caoutchouc is used in the manufacture of braces, of some surgical instruments, and of many other articles for which its elasticity renders it adapted. It is also cut by machinery with great rapidity into very fine thread, to which a still greater degree of tenuity is given by stretching it, as it is wound tightly upon bobbins, where it is allowed to remain till its contractile power is lost. This thread is woven into a variety of ornaments and elastic fabrics.

(*Ann. de Chimie*, xi.; *Journ. of Science*, xxi.; *Do. N. S.*, vi.; *Repertory*, xvii. and other vols. of do.)

Mineral Caoutchouc is a term sometimes but improperly used to denote the elastic varieties of petroleum.

CAPACITY, the same in sense [illegible] CONTENT or volume in pure mathematics. In physics it generally signifies power of holding or retaining. Thus we speak of the capacity of a body for heat, &c.

CAPE, literally Head, (*Cap*, French; *Capo*, Italian; *Cabo*, Spanish and Portuguese; all from the Latin *Caput*,) is a term used to indicate the extremity of a portion of the coast which projects beyond the general line of the shore. On rocky and much-indented coasts, as on that of northern Scotland, capes are, of course, very frequent, while low and sandy coasts sometimes offer no cape for 50 or even 100 miles. On shores of the latter description they are commonly formed by the change in the trending of the land, and form obtuse angles, while on rocky coasts they terminate in acute angles, on which account they [illegible] called *Points*.

CAPE BRETON, an island of [illegible] North America, situated to the E. of Nova Scotia, and [illegible] the S.E. limit of the Gulf of St. Lawrence, [illegible] between 45° 27′ and 47° 4′ N. lat., and between 59° [illegible] and 61° 38′ W. long. Its greatest length from N. to S. [illegible] about 100 miles, and its greatest breadth 85. The shape of the island is something like an irregular triangle, the apex of which forms the northern and narrowest part of the island. Its area, exclusive of the great salt wa[illegible] about 2,000,000 acres, more than one-half of which is supposed to be fit for cultivation.

Cape Breton is [illegible] from the mainland of Nova Scotia by the Gut of Canso and St George's Bay: the former is a channel 21 miles long, and varying from [illegible] to one-and-a-half in width. St. George's Bay is at the N. extremity of this channel. North Point is about 73 miles from Cape Anguille, the S.W. extremity of Newfoundland.

The island of Breton contains much high land, which appears in the form of several ridges of hills, particularly in the N. part, and on the E. and N.W. districts near the coast. Cape Enfumé, on the N.E. coast, in lat. 46° 40′, is 1800 feet above the level of the sea.

The E. and S. coasts are well provided with harbours. Saint Ann's Bay, on the E., leads through [illegible] narrow pass to a safe and capacious harbour of the same name, in which ships of considerable burthen may anchor. [illegible] Harbour, to the [illegible] of Saint Ann's Bay, is an [illegible] miles wide and 4 miles long; which then separates into two narrow arms, one of which runs to the S.W., the other to the S.: at the bottom of the latter of these arms, [illegible] miles from the [illegible] the town of Sydney, the [illegible] of the island. This [illegible] is safe and spacious. It has [illegible] at its mouth, but with sufficient depth of water [illegible] ships to enter. South of Sydney harbour are Laugen, Windham, Murgain, and Miré bays, which last is the outlet of Miré river, which flows into it from the W. On the S.E. coast are Louisbourg Harbour, Gabarus Bay, Portland Cove, Fort [illegible] Harbour, and St. Esprit Harbour. St. Peter's Bay is on the S. coast, and in Lenox channel leading to the Gut of Canso. The only harbour on the W. coast which will [illegible] trading vessels is Port Hood, situated at the N.E. point of St. George's Bay: this harbour is capacious, and completely sheltered. The most remarkable physical feature of the island is the Bras d'Or, an inland sea, which occupies [illegible] portion of its surface, and nearly divides it into two islands. The entrance to this basin is by two channels [illegible] by the island of Boulardrie, which lies between St. Ann's and Sydney harbours on the E. coast. The N. channel is called the Great Entrance, and the channel on the [illegible] side of the island the Little Entrance: the last is impracticable for ships, having a sunken bar at the mouth, [illegible] is seldom used even by boats. Boulardrie island is 20 miles long and its greatest breadth is 2 miles. Within this island is the Little Bras d'Or, a passage to the W. of which leads to Bedeque Bay and Whycocomagh Basin, which are together 15 miles long. Another narrow passage at the S. extreme of the Little Bras d'Or conducts to the large basin, which contains numerous small islands, and branches out into numerous arms or inlets. The most southern of these arms terminates at the isthmus of St. Peter, a neck of land only 900 yards across, which separates the water of Bras d'Or from the Atlantic, at the Bay of St. Peter in Lenox Channel.

The Bras d'Or receives the waters of several rivers, the principal of which are the Bedeque and the Wagamatcook on the N., and the Dennys on the W. From the mouth of the Great Entrance to the S.W. extremity of St. Peter's isthmus this inland basin is 55 miles long, and its width from E. to W. at the broadest part is 20 miles. The depth of water varies from 70 to 360 feet, and in every part it is safely navigable, offering great commercial advantages to the island by affording water-communication, which enables the farmers of every district to dispense with a burdensome land-carriage for their produce.

The island contains several fresh-water lakes. In the N.W. division is Lake Marguerite, 40 miles in circumference, the outlet of which is by a river of the same name 15 miles long, which falls into the sea opposite East Cape, or Prince Edward's Island. Grand Lake, and Miré river or lake, are in the S. division; the latter receives the waters of Salmon river, which flows from the W. There are likewise many small streams on different parts of the coast which are not navigable.

The climate of Cape Breton is not so regular, but neither is it so rigorous as that of the neighbouring continent. The frost does not usually set in long before Christmas; and instead of lasting without intermission until the end of April, as on the mainland, there are frequent intervals of warmer weather, sometimes for a fortnight together, before the frost returns. Very intense cold is however occasionally experienced, and it is not uncommon to see Fahrenheit's thermometer at 20 degrees below zero. The summer months are dry and warm on the eastern coast, but on the western coast there is more moisture. The mean summer heat is 80° Fahr. in the shade. The spring, as in most cold countries, is short, and vegetation is exceedingly rapid. Planting and sowing are done in May, fruits ripen in July, and the harvest is got in in August and September.

Mica slate, clay slate, sienite, and primitive trap, are found in all parts of the island. Transition limestone, greywacke, gypsum, and coal, are very generally distributed. The coal-fields are of great extent in the S.E. division. Neither the extent of the coal-fields nor the quality of the coal has been ascertained to the north of Bras d'Or. Coal is known to exist in the west part of the island; and it has been calculated that the available seams of coal in different parts occupy an area of 120 square miles. That which has been worked is of good quality. Extensive works are now carried on at Sydney and at Lingan, where the seams vary in thickness from 3 to 11 feet: upwards of 40,000 tons were raised in 1832, more than half of which quantity was exported to the United States. Granite prevails among the primitive rocks S.E. of the Bras d'Or. Gypsum is found in great abundance in many parts, and particularly on the shores of the Bras d'Or. There is a high cliff of gypsum on the island of Boulardrie, which is carried off on board large vessels that convey it to the United States; great quantities are likewise shipped every year from Bedeque and Whycocomagh bays, and from Plaster Cove on the Gut of Canso. There are salt springs at Bedeque, at Whycocomagh, at Wagamatcook, and in some other parts on the Bras d'Or: the brine produces from 10 to 12 per cent. of salt. Iron ore is found abundantly associated with the coal about Sydney, Lingan, and in other places. Some of the ore will, it is said, yield 60 per cent of the metal.

The principal vegetable productions of Cape Breton are timber, the common cereal grains, including maize, and potatoes. The timber is of the same kind as is found in the N. parts of the mainland of N. America—the pine, birch, oak, spruce, hemlock, beech, ash, maple, and elm. Considerable shipments of timber are made yearly to the United Kingdom, chiefly from the neighbourhood of Bedeque Bay and Whycocomagh basin. The produce of grain, &c., in the year 1827, the latest of which any correct official return has been made, was as follows:—20,851 bushels of wheat; 31,837 bushels of other grain; 468,507 bushels of potatoes; 15,159 tons of hay. The number of acres in crop in that year was 35,677. In the same return the number of stock is thus given:—1123 horses; 16,821 horned cattle; 23,644 sheep; and 8785 swine. A return professing to give these particulars is made every year by the officers in the colony to the home government, but the same figures have been given year after year for several years past without any explanation.

The population of the island, according to a census taken in 1827, amounted to 9435 males, and 9265 females, together 18,700 souls. The number of births in the same year was 683, of marriages 128, and of deaths 216. It would appear that this enumeration must have been incorrect, or that the population must have very greatly increased since 1827. The official return of 1834 states the number of officers and men enrolled in the island militia to amount to 6652 persons; and presuming that every male inhabitant between the ages of 15 and 60 was included in that number, the total population represented by them must have amounted to at least 26,000 souls.

The coasts and harbours swarm with fish. Those most commonly taken are salmon, cod, herrings, mackerel, shad, halibut, sturgeon, alewives, soles, plaice, haddocks, and smelts. In the lakes and rivers, perch, trout, bream, and eels are abundant. A considerable number of the inhabitants are engaged in the fishery, the produce of which forms one-third of the value of the total exports from the island.

The first settlement was made on this island in 1712 by the French, who gave to it the name of *Isle Royale*. In 1720 they constructed the fortifications of Louisbourg, on the S.E. coast. In 1745 the island was taken by a body of British troops from New England, since which time it has continued in the possession of this country. At the time of the capture the works of Louisbourg were destroyed by order of the English government, and the settlement at that spot has since been altogether deserted. The town of Sydney, now the capital of the island, is situated, as before described, at the bottom of a deep inlet on the E. coast. It was founded in 1823, but its growth has not been considerable; the latest accounts describe it as containing not more than 70 houses, and a population of 500 souls. The town is laid out with regularity, and the houses are neatly built, each having a garden attached to it. The courts of law are held in Sydney, where also the different government officers have their residences. The other settlements hitherto made on Breton Island are situated either on the sea-coast, or on the margin of the Bras d'Or; the interior may be considered as unoccupied. Most of the smaller settlements on the coast have been made by fishermen; many of these are the descendants of the Acadians, or original French settlers from Nova Scotia. The European inhabitants, who occupy themselves in agriculture and in the timber trade, are principally emigrants from Scotland and Ireland: some few inhabitants are the descendants of American loyalists.

The island, which is considered as a county of Nova Scotia, and is included within its government, is politically divided into three districts—S., N.W., and N.E., without any respect having been paid to its natural divisions. The N.W. district is sub-divided into four, and the N.E. into three townships. The S. district, which is much smaller than the others, is not sub-divided. The island sends two representatives to the Nova Scotia House of Assembly.

The greater number of the inhabitants, including most of the Scotch who came from the Highlands, are of the Roman Catholic religion. There are a few Presbyterians, and some members of the church of England, who are under the spiritual care of the bishop of Nova Scotia.

A few Indians, about 300 in number, still remain in the island. Their principal employments are hunting and fishing, but tracts of land have been reserved for them, upon which they grow maize and potatoes. They are quiet and inoffensive, generally remain stationary at their settlements during the winter, but wander along the shores at the return of warmer weather.

Legal provision is made for the support of the poor. The rate levied upon the inhabitants for this purpose in 1834 amounted to 183*l*. 16*s*. In the same year a further assessment of 497*l*. was made in order to defray county charges for the support of the police and for local improvements.

The total imports of the colony in 1832 amounted, according to the custom-house valuation, to 18,072*l*., and its exports to 31,891*l*. About one-fifth of the imports consisted of corn and flour from the United States in return for coals. The remaining imports were of produce from the West India colonies in return for fish, and of British manufactures in return for timber.

Ship-building is carried on to some extent as well for colonial purposes as for sale in England. As many as 50 ships and brigs, besides schooners and smaller vessels, have been launched in one year. The number of registered vessels belonging to Cape Breton in 1828 was 340, varying in burthen from 30 to 200 tons.

Accounts are kept at the custom-house and the different government offices in sterling money, but in the commercial transactions of the inhabitants Halifax currency is used, 100*l*. of which is equal to 90*l*. sterling. The only gold coins current are the doubloon and its parts. The doubloon passes for 16 dollars, or 4*l*. currency. The silver coins are the Spanish dollar (passing at 5s. currency) and its parts, and English crowns, half-crowns, and shillings, which bear a proportionate value. Part of the circulation of the colony consists in notes issued under the authority of the provincial parliament.

(Macgregor's *British America*; Bouchette's *British Dominions in North America*; *Government Statistical Tables*, part 3, supp.)

CAPE COD. [Massachusetts.]

CAPE FEAR. [Carolina, North.]

CAPE OF GOOD HOPE, one of the most southern points of Africa, was discovered by Bartholomew Diaz, the Portuguese navigator, in 1493. Diaz, after exploring the Atlantic coast of Africa as far as Cape das Voltas, 29° S. lat., was driven out to sea by a storm, and the next land he saw was Algoa Bay. He had thus doubled the S. extremity of Africa without knowing it. On his way back he saw the cape, since called the Cape of Good Hope, to which he gave the name of Cabo Tormentoso, or Cape of Storms. On his return home the king of Portugal gave it the name of Cape of Good Hope, as an omen that the Portuguese had now a fair prospect of reaching India, the great object of their maritime expeditions. Vasco de Gama doubled it in November, 1497, on his way to the Indian seas, and from that time the Portuguese considered it as the S. extremity of Africa. But Africa does not terminate in a point; it presents to the S. Ocean a broad line of coast running E. and W., from 18° 23′ E., the longitude of the Cape of Good Hope, to about 26°, which is the longitude of Algoa Bay. This coast is indented by several bays and forms several promontories, of which the Cape of Good Hope is the most westward, but Cape Agulhas, 20° 10′ E. long., advances furthest to the S., being in 34° 45′ S. lat. The Cape of Good Hope is in 34° 22′.

The Cape of Good Hope is the S. extremity of a narrow peninsula about 30 miles long, formed by False Bay on the E., Table Bay on the N., and the Atlantic on the W. Cape Town is on Table Bay on the N. coast of this peninsula, and Simon's Town is on False Bay. This peninsula was the original boundary of the settlement which the Dutch made here about the middle of the seventeenth century, but they soon extended themselves beyond the isthmus which joins it to the African continent. The Hottentots, the natives of this part of Africa, a mild and inoffensive race, were easily though gradually subdued by the Dutch, who encroached step by step upon their country, reducing them to the condition of serfs, or driving away before them the more stubborn tribes. This process continued for more than a century, until at last the Dutch occupied the whole country as far as the great ridge called Nieuwveld Bergen and Sneeuwbergen, about 32° S. lat., which runs E. and W., nearly parallel to the S. coast, and divides the waters that run to the S. from those which flow N. into the Orange River. [Betchouana.] This ridge, the higher summits of which are about 9000 feet above the sea, and are covered with snow the greater part of the year, forms the natural boundary of the Cape colony, although the political boundary stretches considerably farther, the back settlers having extended beyond it on several points through the districts called by the Dutch Onder Roggeveld, Agter Roggeveld, and Middle Roggeveld. North of the limits of the colony, and between it and the Orange River, are the wandering Bosjesmans, the Griguas, or bastard Hottentots, a mixed race, who have attained through the missionaries a considerable degree of civilization, and the Koranna Hottentots. The latter are one of the few Hottentot tribes that have retained their independence. 'They wear the old sheep-skin dress, and preserve the original customs of their nation, which were described by Kolben a hundred years ago, but which the Hottentots in the colony have long since abandoned and forgotten. They live in kraals; their huts are constructed of mats stretched over a frame of sticks in the shape of a bee-hive, and are easily removed on their pack-oxen as they migrate from place to place. Their huts are very dirty, and swarm with vermin. They are altogether in a very low state both of mental and physical refinement, much lower than the Caffres. They are however a good-natured, and, on the whole, a good-looking race, having many of them fine formed heads and prominent features. They lead an indolent wandering life, living chiefly on the milk of their cattle, and seldom roaming far from the banks of the Gariep and its tributary branches. Their cattle are smaller than the colonial breed, and much resemble those of the Betchouana and Caffre tribes. Some of their kraals possess also goats and sheep.' (Thompson's *Travels and Adventures in South Africa.*)

To the N.W., along the Atlantic coast, the colonial territory extends as far N. as 29° 40′ S. lat. The Nieuwveld range makes a bend towards the N. at about 21° E. long., where it assumes the name of Roggeveld Bergen, and runs parallel to the Atlantic coast, leaving a broad belt of lower terraces and valleys between it and the sea. These form the various districts called Roggeveld Karroo, and Lower Bokkeveld and Cold Bokkeveld, which are watered by the Oliphant's River and its affluents. This part of the country is chiefly pasture-land. The Oliphant's River enters the Atlantic at about 31° 40′ S. lat. At the N.W. extremity of the colony is the mission of Kamiesberg, and beyond it is the territory of the Little Namaqua Hottentots, who live between Kamiesberg and the Orange River. The missionary settlement of Pella is in Little Namaqualand. Beyond the Orange River are the Great Namaquas, who are said to extend 200 miles to the N., towards the country of the Damara Caffres. The Namaquas resemble the Korannas in their habits and mode of life. Great Namaqualand is watered, or rather drained, by a stream called by Vaillant the Fish River, and erroneously described in his and Burchell's map as falling into the sea to the N. of Angra Pequena. This river flows southwards into the Gariep, which it joins about 30 miles above the sea. (Thompson and the Rev. John Campbell have given some account of the Namaquas.)

The principal part of the colonial territory stretches to the eastward of Cape Town, and as far as the Caffre frontier, which was until lately fixed at the Keiskamma River, a little beyond the Great Fish River, about 27° E. long. In consequence of the last Caffre war (1835) the eastern boundary is now fixed at the Great Key River, which runs in an oblique direction between 28° and 29° E. long., giving thereby to the colony a length of about 10° of long., upon an average breadth of 2° of lat. The whole colony is a land of terraces, rising one above the other from the coast, divided by almost parallel ridges, and intersected by numerous ravines or beds of torrents, which contain little or no water during the summer months. The want of perennial springs, and the consequent dryness of the soil and scarcity of water for cattle, constitute the principal deficiencies of the colony. The rivers are too allo heir current too rapid for the purposes of navi- arly two-thirds of the land is destitute of vege- ig the greater part of the year. The upper terrac stretches at the foot of the Nieuwveld Bergen for nearly 300 miles in length E. and W., and between 80 and 100 in breadth N. and S., is called the Great Karroo, and is one of the most barren and desolate spots imaginable. Owing to its elevation, which is 3000 feet and upwards, it is bleak and cold in winter. The soil is a sand mixed with clay ntaining particles of iron, which gives it a yellowish colo ; all soil of a similar colour in other parts of the colony d by the name of Karroo ground. The new ttlement of Beaufort is in the N. part of the Great Karroo, in a valley at the foot of the Nieuwveld Bergen. To the E. of the Great Karroo is the settlement of Graaf Reynet, at the foot of the Snow Mountains. Graaf Reynet is wonderfully improved of late years; it is now a handsome village of 300 houses, almost all of which are neat and commodious brick buildings, and some of them even elegant. The streets are wide, laid out at right angles, and planted with rows of lemon and orange trees. Each house has a large allotment of ground behind it, in some instances of several acres, which is laid out in orchards, gardens, and vineyards. These are all watered by a canal from the Sunday River, which branches out into a number of small channels, and each inhabitant receives his due portion at a regular hour. The population of Graaf Reynet, of all colours, amounts to about 1800. The town is built in a sort of basin, almost encircled by the deep channel of the Sunday River which flows down to Algoa Bay, and is closely environed by an amphitheatre of steep rugged mountains. Formerly a considerable trade was carried on between this plac nd Cape Town by means of bullock waggons hich crossed the Great Karroo desert in the winter or pring, and returned before the summer heats had destroyed the vegetation and dried up the springs and rivers. By this road the Cape butchers still procure a large proportion of the sheep and cattle which are wanted for the use of Cape Town and the shipping in Table Bay. But of late years most of the merchandise required by Graaf Reynet, which is a sort of emporium for a large extent of country, is brought by coasters to Algoa Bay and forwarded by waggons from that port. This reduces the land carriage to about one-third of the distance through the Karroo. Graaf Reynet owes much of its prosperity and embellishment to Captain Stockenstrom, a native colonist, and the landdrost or magistrate of the district, which, though far the most extensive and the wildest in South Africa, is one of the best administered. He has established an Agricultural Society to promote emulation and European improvements among his countrymen. There is at Graaf Reynet an English teacher to teach the English language and the classics; and also a day school for females. Captain Stockenstrom placed his own library in one of the school-rooms for public use. (Thompson's *Travels*, 1827.)

To the E. of Graaff Reynet is the village of Cradock, in the new district of Somerset, on the Great Fish River, w[illegible] includes the border territory on the Caffre frontier w[illegible] new Scotch locations or settlements. It is a good gra[illegible] country. The Ghonaqua Hottentots, of whom Va[illegible] speaks, lived in this neighbourhood. The tribe is now extinct. Lower down towards the coast, and between the Fish River and Algoa Bay, is Graham's Town, a well [illegible] and the Drossdy or capital of the Albany district, with about 2500 inhabitants chiefly English. [ALBANY.] Gr[illegible] Town is the chief place in the E. part of the colony, and the head-quarters of the military on the Caffre frontier. Bathurst is another settlement near the mouth of the [illegible] River. Port Elizabeth in Algoa Bay is the shipping and landing-place for the E. part of the colony, but is far from safe. Inland to the W. of Algoa Bay a long ridge, known by the general name of Zwart Bergen, or Black Mountains, which in some places rises [illegible]000 feet above the sea, ru[illegible] parallel to the coast, forming the S. boundary of the grea[illegible] Karroo plain. Between it and the coast are several terraces, one below the other, down to the sea shore. These are known by the name of Langenkloof, Bankenskloof, &c. In this part of the country, between the Gamtoos and the Gauritz rivers, the sides of the [illegible] covered with majestic forests, a thing very rare in the rest of the colony, which is generally without wood. These forests supply not only Cape Town, but also a great part of the inland districts, with timber for building and other purposes. It is shipped at Pl[illegible] the mouth of the Knysna, for Cape Town. Th[illegible] a fine natural harbour, in which it is [illegible] large ships might lie at anchor secure from all winds, but the entrance is narrow and rather dangerous. The want of good harbours is a great dr[illegible]ck upon the colony. W[illegible] the Gauritz river is the di[illegible] of Zwellendam, the soil of which is well fitted for the [illegible]tivation of corn. The rain[illegible] that fall in the season of [illegible] along the maritime district render irrigation less [illegible]sary in the process of agriculture than it is to the n[illegible] and of the Zwart Mountains, which intercept the refreshing showers brought [illegible] the S.E. wind. The Breede river, which falls into the [illegible] Port Beaufort, and is navigable for vessels of 200 tons, affords great advantages to the trade of this district. As yet, however, the [illegible]tivation of corn is mostly limited to the more western [illegible] Cape district, the produce of which comes chiefly by land to Cape Town, or is shipped at St. Helena bay from the country in that neighbourhood. The district of Stellenbosch, immediately E. of the Cape district, along the skirts of the chain of Hottentots' Holland mountains, and within a distance of from 30 to 40 miles from Cape Town, is the principal wine district in the colony: the wine farms begin at Hottentots' Holland and continue through Stellenbosch, Bany hoek, Fransch hoek, Drakenstein, and the Paarl to Waggonmaker's Valley. These produce the common wine called Cape Madeira and Pontac. The skirts of Table Mountain, the farm of Constantia and its neighbourhood, Hout's Bay, and Tiger Bay, [illegible] the finer wines. Exclusive of the Cape and Stel[illegible] tricts, all the rest of the colony may be considered [illegible] as nearly a grazing country. The Dutch farmer[illegible] interior, or boors, as they are called, have been [illegible] as indolent, rude, and repulsive in their habits. [illegible] and other recent travellers however give a somewhat more favourable account of [illegible]. The want of markets for their surplus produce, the [illegible]ness of the roads, and the unfavourable nature of [illegible] and climate in many parts, may account for their [illegible]tion. They produce all they want for their consumption, and their houses appear to be well stocked with provisions. Hospitality to strangers is general. Their harsh treatment of the poor Hottentots, and the deeds of violence perpetrated against the Bosjesmans near the frontiers, exhibit the worst parts of their character, though the shooting of the Bosjesmans, it ought to be observed, is often done by them in self-defence.

The wild animals of the colony are, the lion, leopard, hyæna, rhinoceros, the wolf, and jackal. They, however, as well as the elephant, have much decreased in number, having retreated before the advancing steps of civilized man. In the more secluded parts of the interior springbocks are numerous, as well as ostriches; quaggas and giraffes are also found. The black eagle of the Cape, and th[illegible] large vulture or condor, are seen in the mountains. ([illegible] Lichtenstein, Thompson, and the Rev. J. Campbell.)

Statistics.—The population of the different districts of th[illegible] colony in 1831 was as follows:—

	White and free coloured persons		Negro apprentices, formerly slaves.		Total.	
	Male.	Female.	Male	Female.	Male	Female.
Ca[illegible]	[illegible]	7,122	2,861			9,844
[illegible]	4,173	3,734	2,515	2,245	6,68[illegible]	5,979
[illegible]	4,181	3,674	5,465		5,646	7,659
We[illegible]	5,713	5,651	2,689		8,402	7,910
[illegible]	6,810	6,481	1,736	1,517	8,5[illegible]6	7,998
[illegible]	3,286	2,740	1,197	1,161	4,483	3,901
[illegible]	5,135	4,485	727	672	5,862	5,157
[illegible]	5,200	4,706	79	72	5,2[illegible]9	4,778
S[illegible]	5,390	4,794	757	674	6,147	5,468
[illegible]al Reynet	13,840	13,028	1,554	1,255	15,394	14,283
Total	60,440	56,418	19,580	16,589	80,020	73,007
					153,027	

Slavery was abolished in the Cape colony by the act, which came into operation on August 1st, 1834.

According to the official returns the number of births in 1834 was 5071, or 1 in 30 of the population; of marriages, 810, or 1 in 189; of deaths, 2053, or 1 in 74. This rate of mortality is so much more favourable than in other countries that it is not possible to give full credit to the statement. The colony has received annual accessions to its numbers since the year 1820, when the English government first encouraged the settlement of emigrants from the United Kingdom. The number of settlers in the various [illegible] have b[illegible]

1820	1063	1825	114	1830	. 201
1821	404	1826	116	1831	. 58
1822	192	1827	114	1832	. 202
1823	184	1828	135	1833	. 517
1824	119	1829	197	1834	. 288

The numbers of public schools and of children taught therein in the several districts in 1834 were as follows:—

	Schools	Males.	Females.	Total.
Cape Town .	4	141	127	268
Cape District	8	271	267	538
Stellenbosch	3	60	33	93
Worcester .			35	87
Zwellendam				133
George .		29	17	46
Uitenhage .		125	42	167
Albany .		76	28	101
Somerset .		55	61	116
Graaf Reynet		47	28	75
				1627

There are also 53 private schools in the colony, but the great distance at which many of the inhabitants of this thinly peopled colony reside from any school obliges those who can afford it to employ private teachers in their families. In such cases other children whose parents reside in the same neighbourhood partake in the instruction.

The extent of land in cultivation, distinguishing pasture from arable, and of uncultivated land, as well as the number and descriptions of stock, and of various kinds of produce as stated in the returns for 1834, are given in the following table. No general survey of the colony has been made. The estimated number of acres granted to individuals is about 18 millions, besides several 'loan places,' for which no arrangements as to quit-rents have been made. The extent of land still ungranted is computed at more than 50 millions of acres, exclusive of the ceded territory in which there are native settlers.

	Land in cultivation.		Acres of uncultivated land.	Number of Stock.				Kinds and Quantities of Produce.									
	Pasture.	Acres in crop.		Horses.	Horned cattle.	Sheep.	Goats.	Bushels of wheat.	Bushels of barley.	Bushels of rye.	Bushels of oats.	Pounds weight of oat-hay.	Bushels of maize and millet.	Bushels of beans, peas, and lentils.	Bushels of potatoes.	Leggers of wine, 152 gals. each.	Leggers of brandy, 152 gals. each.
Cape Town	..	..	..	663	500	1,000	100										
Cape District	1,200,000	37,880	1,600,000	7,581	19,201	15,691	10,12[illegible]	127,7[illegible]	45,8[illegible]	9,[illegible]51	71,736	2,843,600	1,200	192	1,44[illegible]	1,210	55
Stellenbosch	231,774	27,494	266,162	6,347	15,103	8,293	19,611	87,6[illegible]	26,820	7,794	[illegible],588	632,500	206	300	5,48[illegible]	[illegible],371	511
Worcester	1,416,022	102,958	.	13,679	24,467	383,800	689,100	75,22[illegible]	44,848	19,89[illegible]	40,500	..	..	..	.	593¼	1[illegible]0¼
Zwellendam	5,176,000	22,980	570,845	19,535	31,313	100,973	113,40[illegible]	135,5[illegible]	104,920	1,600	61,000	.	2,[illegible]85	6,700	2,580	5[illegible]2	210
George	56,800	10,000	1,914,914	4,461	26,193	20,623	37,826	25,50[illegible]	16,[illegible]	90	[illegible]	10 000	80	8	800	170	147
Uitenhage	57,605	6,397	1,945,719	2,500	55,967	72,152	59,917	14,991	11,619	111	16,[illegible]	25 000	50	50	500	28	27
Albany	2,199,962	8,885	863,153	2,755	48,945	104,000	21,000	30,000	2,500	200	6,000	300 000	6 000	7,[illegible]0	3,000		
Somerset	9,789,011	3,156	1,897,797	7,149	61,829	671,243	181,198	37,520	7,195	.	1,500	1,000 000	1 [illegible]	51	1,500	2[illegible]¼	7
Graaff Reynet	140,000	3,641	..	3,317	39,026	54[illegible],600	280,200	7 459	..	..	.		..	..	..	58	18
Total	20,070,474	223,389	incomplete	67,987	312,569	1,919,778	1,268,862	510,529			incomplete					12,095	1,075¼

The number of mills and manufactories of various kinds in the different districts of the colony were returned as under in 1834:—

					Zw lam	Ge	iten	llany
Water Mills			6	1	9	1		
Windmills								
Horse Mills					2	1		
Tanneries					6	3		
Hat Manufactories	3	.	..	5	..	1		
Breweries	4	2	..	..	..	1		
Candle Manufactories					..	..	..	
Snuff Manufactories					1	..	..	
Sawing Mills							1	
Tile Kilns								

In Cape Town there are also one steam mill, two distilleries, one soap manufactory, and one iron foundry; a cutlery manufactory in Zwellendam; and a rope manufactory in Stellenbosch.

The fisheries form an important branch of industry in those districts which are on the coast. In 1834 the whale fishery produced 23 black whales and 30 tons of spermaceti oil: the value of the whole being 59,6[illegible]*l.* This fishery is carried on in boats of from two to seven tons burthen each. About 50 such boats are employed in the whale and other fisheries in Table Bay alone. Every settler whose farm is situated on the sea-coast keeps a fishing-boat for the supply of his own family.

The trade carried on with the natives in the interior of the country has not only much increased of late, but has essentially altered its character. The medium of traffic on the part of European settlers was formerly made up of beads, buttons, and other worthless articles of the like description, but the natives now in exchange for their hides, horns, and ivory, demand blankets, woollen cloths, iron, and various domestic utensils and tools made of that metal. This trade, which formerly was of a very fluctuating character, has now become as regular as that carried on between any commercial people, and is continually growing in amount.

The extent of the external trade of the colony may be seen from inspection of the following tables, which state the number and tonnage of shipping inwards and outwards from various parts of the world, and the money value of the goods which they conveyed, in 1834.

SHIPS INWARDS

PORTS.	G. Britain		B.Colonies		United States		Other Foreign		Total	
	Ships	Tons	Ships	Tons.	Ships	Tons.	Ships	Tons	Ships	Tons
Cape Town	78	25,017	98	55,140	31	9,572	82	18,119	289	88,1[illegible]
Simon's Town	9	3,141	8	2,973	20	5,6[illegible]	4	2,003	41	13,719
Port Elizabeth	15	2,771	9	2,227	2	559	2	171	28	5,728
Total	102	30,959	115	40,340	53	15,763	88	20,593	358	107,655

SHIPS OUTWARDS

	Britain		B Colonies		States		Foreign		Total.		
										Tons.	Men.
Cape Town									283	96,554	6,038
Simon's Town							4	1,96[illegible]	43	11 135	1,109
Port Elizabeth									21	4,166	296
Total	[illegible]35	50 41	24	36,716	41	15 1 4			[illegible]30	115,155	7,998

Estimated value of imports from

	G. Britain.	British Colonies	United States.	Other Foreign States	Total.
	£	£	£	£	£
Cape Town	2,5,049	27,900	4,349	86,229	392,937
Simon's Town	503	3,538	5,391	398	9,621
Port Elizabeth	56,868	3,130	..	19	60,317
Total	332,420	33,968	9,740	86,640	462,768

Estimated value of exports

	G. Britain	British Colonies	United States.	Other Foreign States.	Total.
	£	£	£	£	£
Cape Town	171,319	100,830	4,603	14,822	297,574
Simon's Town	5,797	570	61	4	6,432
Port Elizabeth	61,142	4,156	..	498	65,796
Total	238,258	111,556	4,664	15,324	369,809

CAPE TOWN, the capital of the colony of the Cape of Good Hope, is in 33° 55′ S. lat., and 18° 21′ E. long.; at the foot of Table Mountain, on the shore of Table Bay, from which the ground rises with a gentle slope towards the mountain.

Cape Town was founded by the Dutch in 1650, and, together with the colony, continued in their possession until 1795, when it was taken by the English. At the peace of Amiens it was restored to the Dutch, but was again taken by the English in 1806, and has since remained in their possession. The town is well and regularly built. The houses, which are for the most part of a good size, are nearly all of red brick or stone, and furnished with a verandah in front. The principal streets are wide and clean, and regularly laid out, intersecting each other at right angles, and shaded with oaks and elms.

The castle is on the right-hand side of the town looking towards Table Bay, the anchorage in which it commands. This fortress is of considerable strength. Its form is pentagonal, and it has a broad fosse and regular out-works. Many of the public offices of the colony are within its walls, which likewise contain barracks capable of holding 1000 men. Connected with the castle on the E. by a rampart called the *sea-lines* is Fort Knokke, and still further E. is Craig's Tower and battery. On the W. side of the town, and surrounding the hill called the Lion's Rump, are Chavonne, Amsterdam, and Rogge batteries; and, besides these, the entrance to the bay is commanded by a battery called the Mouillé.

Table Bay is sufficiently capacious to contain a great number of ships, but it is exposed to a heavy swell during the prevalence of the westerly winds in June, July, and August. At other times the anchorage is tolerably safe. When discharging or taking in goods ships are moored very near the jetty or landing place, which is built of wood, and is at the E. side of the town. Vessels that touch at the port for water and refreshments only anchor farther out, and if provided with a chain cable ride at single anchor with 80 or 90 fathoms of cable, to counteract the effects of the swell. If provided only with rope cables it is necessary to ride with a bower-anchor and a kedge, and to have another bower-anchor always in readiness to let go.

Cape Town contains four Protestant churches and a Roman Catholic chapel. Of the former, St. George's church, in which the English episcopal form of worship is celebrated, is capable of containing 1160 persons. The Dutch Calvinistic church will hold 1800, and the Lutheran church 1400 persons. The Presbyterian form of worship, according to the church of Scotland, is performed in St. Andrew's church. The ministers of all these places of public worship are supported by the colonial government.

The supreme court of justice for Cape colony is held within the town under the presidency of a chief justice and two puisne judges; there are besides a magistrates' court and a police office, having a judge and superintendent and a deputy.

The plain which surrounds Table Mountain is composed of blue schistus, interrupted by masses of blue flinty rock, and resting upon a tenacious clay impregnated with iron; the colour of the clay varies from pale yellow to deep red, and abounds with brown foliated mica, interspersed with blocks of granite. Rising from the base of Table Mountain are beds of vertical schistus: over these are veins of granite, varying in thickness from less than an inch to six feet. After ascending 900 feet the mountain appears to be nearly a solid mass of granite, characterised by large crystals of felspar, and containing, besides quartz and mica, occasional masses of hornblende. After ascending 900 feet higher the granite ceases, and is surmounted by thin horizontal strata of red sandstone, which formation continues for near 200 feet, and is then succeeded by a more indurated sandstone, quite white, and containing imbedded in it pieces of quartz from the size of a pea to that of an apple; this formation continues to the summit of the mountain, which is 3567 feet above the level of the sea.

An observatory has been established at Cape Town under the control of the lords of the Admiralty. Its situation is to the N. of the town, about two miles from it, and rather more than a mile from the sea-shore.

CAPE HORN, which is considered the southern extremity of America, is not a part of the continent, but is the most southern point of a small island which belongs to the extensive group commonly called *Tierra del Fuego*. It is situated about 56° S. lat. and 67° 10′ W. long., and consists of a high precipitous black rock, which is conspicuous above all the neighbouring land, utterly destitute of vegetation, and running far out into the sea. The strong W. gales which blow in the neighbourhood of this cape render it difficult to be doubled from the east. A century has not yet elapsed since the squadron under Lord Anson was partly destroyed in the attempt, and the Spanish fleet under Pizarro was entirely lost in doubling Cape Horn. But the improvements in navigation have stripped this cape of its terrors, and the passage may be effected with comparative ease and certainty. Gales from the west blow during the summer (October to April) nearly without interruption, but only near the Cape; in 60° S lat. they are more variable. During the winter east winds are more frequent; but at that season the navigation is rendered dangerous by the floating islands, which approach the Cape, and are found even farther to the north. Capt. B. Hall did not find the east current near it greater than may be attributed to the effect of the west gales. (Capt. Basil Hall.)

CAPE VERD ISLANDS (Ilhas Verdes) were so called by the Portuguese because the sea to the west of them is covered with Gulf-weed, so as to present some resemblance to extensive meadows. This group of islands is about 300 miles from the western shores of Africa, between 14° 17′ and 17° 19′ N. lat., and between 22° 10′ and 25° 10′ W. long. Their shores are commonly low, or of moderate elevation, but in the interior the islands often rise to a considerable height. They are doubtless of volcanic origin, and a volcano still exists on the Island of Fogo. The soil is very dry, but by no means sterile. The rainy season lasts from July to November, and is attended with thunder-storms and thick fogs. Sometimes no rain falls for three or four years together, and the consequence is a famine. During the rainy season the climate is unhealthy. Indian corn and rice are the principal objects of agriculture; but all the fruits of the south of Europe and of western Africa grow abundantly, especially oranges, cocoa-nuts, and pine-apples. Melons come to great perfection, and also grapes, but the inhabitants are not permitted to make wine. Sugar and cotton are grown, but very little is exported. Among the domestic animals the most numerous are goats and fowls; goat skins are the principal article of export, upwards of 6000 being annually shipped. Asses are also numerous, and are exported to the West Indies. The most remarkable of the wild animals are monkeys and bisam-cats; turtles are found in the neighbouring seas in great numbers. Salt is made in most of these islands on the low shores, and constitutes one of the principal articles of export; it goes to North America. The inhabitants, who are stated to amount to between 40,000 and 50,000, are mostly negroes, mixed with some mulattoes, the descendants of the Portuguese who have settled here. There are very few whites. The inhabitants are Catholic Christians, and great zealots; their general language is the Portuguese. Vessels bound for the East Indies stop here for fresh provisions, but not so frequently now as formerly.

This group consists of 14 islands, 9 of which are inhabited. Branca, Chaon, Carnera, and Ghuay, are bare rocks, and Ilha do Sal has a sterile soil, but is important for the great quantity of salt collected in the numerous lagunes with which its beach is covered, and which is formed by solar evaporation. The surface of the whole group is calculated to be about 1700 square miles.

S. Jago, the largest island, is about 50 miles long, and nearly 24 broad in the widest part: its area is 770 square miles, and population above 12,000 souls. The capital, Ribeira Grande, or S. Jago, where the Portuguese governor resides, contains 500 houses; it is situated at the mouth of a river which forms a small harbour, but it is not much visited. Porto Praya is a good harbour, and is visited by the vessels bound for India: it contains 1200 inhabitants.

S. Nicolo, the second island in extent, is 70 miles long, but narrow. It has more than 5000 inhabitants, who are very industrious, and make cotton-cloth, stockings, and tan goat-skins. It has a small town of the same name.

The other islands are Mayo, Fogo, Brava or S. João, Bona Vista, S. Lucia, S. Vincente, and S. Antonio.

These islands were discovered, in 1449, by the Portuguese under the conduct of Antonio de Noli, a Genoese in the service of Prince Henry, and some years afterwards they were settled. They are still in the possession of the Portuguese, and under a separate governor. Besides the few articles (goat-skins, salt, turtles, fruits, saltpetre, cattle, and asses) which are sent to Europe, the inhabitants have some commerce with the continent of Africa, where they sell cotton cloth.

In the sea which divides this group from Africa, the atmosphere for the greatest part of the year, is hazy and foggy, especially near the continent, so that the vessels sailing south prefer to keep to the west of the islands. The same phenomenon of a foggy atmosphere is observed farther north, between the Canaries and the coast north of Cape Bojador.

CAPELLA, or α Aurigæ, a star of the first magnitude, in the body of the goat which Auriga is represented as carrying. [Auriga.] This is a double star, with a small proper motion of 0″·13 in right ascension, — 0″·35 in declination.

CAPERCAILLIE, CAPERKALLY, or CAPERCALZE, the Scotch name for the capercail or wood-grouse, now no longer holding a place in the British Fauna, of which it was one of the greatest ornaments.

Pennant refers this bird to the *Coc de Bois ou Faisan Bruyant* of Belon, and the *Gallo Cedrone* of the Italians; and it is very probable that these and other names, viz., *Gallo di Monte*, *Gallo Selvatico*, *Gallo Alpestre*, *Fasan Negro*, and *Fasiano Alpestre*, were applied both to the caperkally and the black-cock, according to the different localities where the species occurred. [Black-Cock.] Part of Belon's description of his *Coc de Bois*—such, for example, as the plume 'si *noire* et reluisant au-dessous du col, et de l'estomach, qu'elle monstre en estre toute changeante,' and the tail with the feathers 'voultees, c'est à dire courbeés en arc, et larges par le bout; ayant quelque petites madrures blanches,' might apply to the black-cock, while 'the size approaching to that of the peacock,—the head not less than that of a bustard, with the great massive trenchant beak,'—are much more applicable to the caperkally, which is *Le grand Coq de Bruyères* of Brisson, the *Coq de Bruyère ou Tètrao* of Buffon, *Kjader* of the Fauna Suecica, *Tjaderhona* of Hasselquist, the *Tetrao Auerhan* of Temminck, *Auer Hahn* of Frisch, *Auerwaldhuhn* of Bechstein, *the Peacock of the Wood* (*Pavo Sylvestris*) of Gualdus Cambrensis, *Capricalca* of Sibbald, *the Cock of the Mountain or Wood* (called by the Venetians *Gallo di Montagna*) of Willughby, *the Cock of the Wood or Mountain* of Ray, *Wood or Great Grous* of Pennant, *Ceiliog coed* of the antient British, *Urogallus seu Tetrao Major* of Aldrovand, *Tetrao Urogallus* of Linnæus, and *Urogallus Vulgaris* of Fleming.

Geographical Distribution.—Temminck says that it is numerous in the north of Asia, and in Russia towards Siberia; and that it is common in Livonia, sufficiently abundant in Germany, in Hungary, and in certain parts of the Archipelago: he adds that it is more rare in France, and never found in Holland. Pennant states that these birds are common to Scandinavia, Germany, France, Italy, and several parts of the Alps. It is added in a note, on the authority of Hasselquist, that the bird was shot in the Isle of Milo on a palm-tree, and, on that of Belon, that it is found in Crete; and it is observed that the English translator of Hasselquist gives a false name to it, calling it *Black Game.* Mr. Lloyd says that it is to be found in most parts of the Scandinavian peninsula; indeed as far to the north as the pine-tree flourishes, which is very near to the North Cape itself. He adds that the bird is very rare in the more southern of the Swedish provinces.

That it was once frequent in the British islands there is no doubt, though it is now utterly extinct as a wild British species. Ray says 'Anglia hunc non alit. In Hibernia inveniri dicitur.' Pennant writes—'This species is found in no other part of Great Britain than the Highlands of Scotland, north of Inverness, and is very rare even in those parts. It is there known by the name of *Capercalze, Auercalze,*' and in the old law books *Caperkally*—the last signifying the horse of the woods—this species being, in comparison of others of the genus, pre-eminently large.' He also says—'In our country I have seen one specimen, a male, killed in the woods of Mr. Chisolme, to the north of Inverness. About the year 1760 a few were to be found about Thomas Town in the county of Tipperary, but I suspect that the breed is now extinct in every part of Ireland.' Graves (1813) says—'This species is nearly extinct in Great Britain; two instances of its being killed in Scotland within these few years are the only satisfactory accounts we have received of its being recently found in these kingdoms. One was killed by a gentleman of the name of Henderson near Fort William about six years ago, and sent to Dundee; but the vessel that conveyed it to London was detained so long on the passage that the bird became so putrid that only the head and legs could be preserved. The other specimen was shot by Captain Stanton near Burrowstoneness two winters ago: they were both males. Some few are said to be yet remaining in the pine forests of Scotland, and also in the mountainous parts of Ireland.' Bewick speaks of it as very rare in Great Britain. In the last edition of Montagu (1833) it is stated that the bird was last seen in 1760 in the woods of Strath-glass, that it continued in Strathspey till 1745, and that recent attempts have been made to re-introduce it from Norway without success. Selby (1825) alludes to its extirpation, and omits the species. Jenyns (1835) observes that it was formerly abundant in the mountainous forests of Scotland and Ireland, but that it is now extirpated.[*] A living pair came into the possession of the Zoological Society of London, but they did not long survive the loss of liberty.

We agree with Mr. Lloyd that it is a pity more attempts are not made to re-introduce this noble species, especially in Scotland, a locality, as he observes, not very dissimilar to the south of Sweden—especially now that the pine so much abounds there, from which tree when the ground is covered with snow the capercailies obtain nearly their whole sustenance. He adds that it is true a pair once in a while have been brought over to this country from Scandinavia, though, from some cause or other, and none more likely than over and improper feeding, these have soon perished. The experiment, as he says, should be made with a greater number of birds, and they should be entrusted to a person fully conversant with their habits. They are often domesticated in Sweden, and at both Uddeholm and Risäter Mr. Lloyd knew that they were kept for a long period in aviaries for the purpose. These were so perfectly tame as to feed out of the hand. Their food principally consisted of oats and the leaves of the Scotch fir (*Pinus sylvestris*), large branches of which were usually introduced into their cages once or more in the course of the week; they were also supplied with abundance of native berries when procurable. They were amply provided at all times with water and sand; the latter of which was of a rather course quality, and both were changed pretty frequently. The same author observes that it is a mistake that the capercailie will not breed in a state of domestication; and as we are not without hope that some spirited proprietors—and Scotland has many such—may follow the example of the Earl of Fife, and endeavour to restore the bird to our Fauna, we insert the following anecdotes and directions to stimulate and guide those who may be inclined to try their fortune:—

'A few years ago,' writes Mr. Lloyd in his interesting *Field Sports,* 'I procured a brace of those birds, consisting of cock and hen, for a friend of mine, Mr. Thomas Fowell Buxton, the member for Weymouth, then resident at Cromer Hall in Norfolk. After a lapse of a few months the hen laid six eggs, and from these, in process of time, six capercali were produced. The chicks lived until they had attained to a very considerable size, when, owing to the effects, as it was supposed, of a burning sun, to which they had been incautiously exposed, the whole of them, together with the mother, died. On this mishap the old cock, the only survivor, was turned loose into the game preserves, where he remained in a thriving condition [illegible]ut a year [illegible] half. At last [illegible] met [illegible], though this was supposed to be owing rather to accident than natural causes.'

In further corroboration of the [illegible] that the capereali will breed when in confinement, we [illegible] the following quotation from Mr. Nilsson's work. That gentleman's authority was the öfwer director of Chr[illegible]; and the birds alluded to were at a forge in the province of Dalecarlia:—

'They were kept together during the winter in a large loft over a barn, and were fed with corn, and got occasionally a change of fresh spruce fir, pine, and juniper sprigs. Early in the spring they were let out into an inclosure near the house, protected by a high and close fence, in which were several firs and pines, the common trees of the place. In this inclosure they were never disturbed; and during the sitting season no one approached except the person who laid in the meat, which at that time consisted of barley, besides fresh sprigs of the kinds before mentioned. It is an indispensable rule that they shall have full liberty, and remain entirely undisturbed, if the hens are to sit and hatch their young. As soon as this had occurred, and the brood were out, they were removed to the yard, which was also roomy, and so closely fenced that the young ones could not escape through; and within this fence were hedges and a number of bushes planted. Of the old ones one of the wings was always clipped, to prevent their flying. I have seen several times such broods, both of black game and capereali, eight to twelve young ones belonging to each hen. They were so tame that, like our common hens, they would run forward when corn was thrown to them. They should always have a good supply of sand and fresh water.'

M. Greiff gives the following directions for rearing the young:

'The eggs,[*] usually so called, to be found in ant hills and stubble, are to be gathered; hard boiled eggs are to be chopped and mixed amongst fine moistened barley-meal; also pea-haulm and trefoil-grass are to be given them for food, and water to drink, which must be placed so that they cannot overturn the pitcher, for they suffer very much if they get wet when they are young. Dry sand and mould they never should be without. When they get larger, and cabbage-leaves, strawberries, cranberries, and blueberries are to be had, they are fond of such food; and when they are full grown they eat barley and wheat; and in winter they should get young shoots of pine and birch-buds. I have seen many people who thought they treated young birds well by giving them juniper berries; but they never resort to this kind of food but in case of necessity.'

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[*] But see page 263.

[*] Pupæ.

The following observations of Professor Nilsson show how well this bird is adapted for the game preserve.

'When the capercali is reared from the time of being a chicken, he frequently becomes as tame as a domestic fowl, and may be safely left by himself. He, however, seldom loses his natural boldness, and, like the turkey-cock, will often fly at and peck people. He never becomes so tame and familiar as the black-cock. Even in his wild state the capercali frequently forgets his inherent shyness, and will attack people when approaching his place of resort. Mr. Alderberg mentions such an occurrence. During a number of years, an old capercali-cock had been in the habit of frequenting the estate of Villinge at Wermdö, who, as often as he heard the voice of people in the adjoining wood, had the boldness to station himself on the ground, and, during a continual flapping of his wings, pecked at the legs and feet of those that disturbed his domain.'

For the details of the experiment made by Lord Fife in the years 1828, 1829, 1830, and 1831, we must refer the reader to Mr. Wilson's interesting paper in 'Jameson's Journal' for July, 1832. Suffice it to say that, after some failures, Mr. Wilson, in August, 1831, s[illegible] at Braemar five young capercailies, which had been hatched there, and were, with their parents, in good health. The intention of the Thane was, 'as soon as some healthy broods had been reared in confinement, to liberate a few in the old pine woods of Braemar, and thus eventually to stock with the finest of feathered game the noblest of Scottish forests.'

Food.—Temminck makes it to consist of many sorts of berries, the buds and young shoots of the leaves of trees and of Alpine shrubs; also of insects, but rarely of seeds. Mr. Lloyd says that it feeds principally on the leaves of the Scotch fir (Tal), and very rarely on those of the spruce (Gran): also on juniper berries, cranberries, blueberries, and others common to the northern forests, and occasionally in the winter time on the buds of the birch &c. The young, he says, are, for the most part, sustained at first on ants, worms, insects, &c.

Reproduction.—Temminck says that the nest is formed in high herbage and under bushes, and that the hen lays from six to sixteen obtuse eggs of a dirty white colour, marked with yellowish spots. Latham states that he is well informed that the nest of one found in Scotland was placed on a Scotch pine: 'if so,' says Montagu, 'it differs from all the genus, who are known to lay their eggs on the bare ground.' Mr. Lloyd, who had the best opportunities for ascertaining the fact, observes that the hen makes her nest upon the ground, and lays from six to twelve eggs, and that her young keep with her till towards the approach of winter; but that the cocks separate from the mother before the hens. The same author describes, evidently from personal observation, the *lek* or play of the male in the breeding season, and a[illegible]n itself most interesting, and corrects some errors which have gone abroad on the subject, we make no apology for inserting it.

'At this period, and often when the ground is still deeply covered with snow, the cock stations himself on a pine, and commences his love-song, or *play* as it is termed in Sweden, to attract the hens about him. This is usually from the first dawn of day to sunrise, or from a little after sunset until it is quite dark. The time, however, more or less, depends upon the mildness of the weather, and the advanced state of the season.

'During his play the neck of the capercali is stretched out, his tail is [illegible]d and spread like a fan, his wings droop, his feathers are ruffled up, and in short, he much resembles in appearance an angry turkey-cock. He begins his play with a call something resembling *Peller, peller, peller*; these sounds he repeats at first at some little intervals; but as he proceeds they increase in rapidity until at last, and after perhaps the lapse of a minute or so, he makes a sort of gulp in his throat, and finishes with sucking in, as it were, his breath.

'During the continuance of this latter process, which only lasts a few seconds, the head of the capercali is thrown up, his eyes are partially closed, and his whole appearance would denote that he is worked up into an agony of passion. At this time his faculties are much absorbed, and it is not difficult to approach him: many, indeed, and among the rest Mr. Nilsson, assert that the capercali can then neither see nor hear: and that he is not aware of the report or flash of a gun, even if fired immediately near to him. To this assertion I cannot agree, for though it is true that if the capercali has not been much disturbed previously he is not easily frightened during the last notes, if so it may termed, of his play; should the contrary be the case [illegible] constantly on the watch, and I have reason to know that, even at that time, if noise be made, or that a person exposes himself incautiously, he takes alarm and immediately flies.

'The play of the capercali is not loud, and should there be wind stirring in the trees at the time, it cannot be heard at any considerable distance. Indeed, during the calmest and most favourable weather, it is not audible at more than two or three hundred paces.

'On hearing the call of the cock, the hens, whose cry in some degree resembles the croak of the raven, or rather, perhaps, the sounds *Gock, gock, gock*, assemble from all parts of the surrounding forest. The male bird now descends from the eminence on which he was perched to the ground, where he and his female friends join company. The capercali does not play indiscriminately over the forest, but he has his certain stations (*Tjador-lek*, which may perhaps be rendered his playing grounds.) These, however, are often of some little extent. Here, unless very much persecuted, the song of these birds may be heard in the spring for years together. The capercali does not during his play confine himself to any particular tree, as Mr. Nilsson asserts to be the case, for, on the contrary, it is seldom he is to be met with exactly on the same spot for two days in succession.

'On these *lek* several capercali may occasionally be heard playing at the same time; Mr. Greiff, in his quaint way, observes, "it then goes gloriously." But so long as the old male birds are alive they will not, it is said, permit the young ones or those of the preceding season to play. Should the old birds, however, be killed, the young ones, in the course of a day or two, usually open their pipes. Combats, as it may be supposed, not unfrequently take place on these occasions, though I do not recollect having heard of more than two of those birds being engaged at the same time.

'Though altogether contrary to law, it is now that the greatest slaughter is committed among the capercali; for any lump of a fellow who has strength to draw a trigger may, with a little instruction, manage to knock them down. But as the plan of shooting these noble birds during their play is something curious, I shall do my best to describe it.

'It being first ascertained where the *lek* is situated, which is commonly known to the peasants and others in the vicinity, the sportsman (if so he may be called) proceeds to the spot, and listens in profound silence until he hears the call of the cock. So long, however, as the bird only repeats his commencing sound, he must, if he be at all near to him, remain stationary; but the instant the capercali comes to the wind-up, the gulp, &c., during which, as I have said, his faculties of both seeing and hearing are in a degree absorbed, then he may advance a little. But this note lasts so short a time that the sportsman is seldom able to take more than three or four steps before it ceases, for the instant that is the case he must again halt, and, if in an exposed situation, remain fixed like a statue. This is absolutely necessary, for during his play, excepting when making the gulp, &c., the capercali is exceedingly watchful, and easily takes the alarm. If all remain quiet, the bird usually goes on again immediately with his first strain; and when he once more comes to the final note, the sportsman advances as before, and so on, until he gets within range of shot.

'To become a proficient at this sport requires a good deal of practice. In the first place, a person must know how to take advantage of the ground when advancing upon the capercali, for, if full daylight, this is hardly practicable (whatever may be said to the contrary) in exposed situations; and in the next, that he may not move forward, excepting upon the note which is so fatal to that bird. This is likely enough to happen, if it be an old cock that has been previously exposed to shots, for he often runs on, as I have repeatedly heard him, with *Peller, peller, peller*, until one supposes he is just coming to the gulp, when he suddenly make a full stop. If, therefore, a person was then incautiously to advance he would in all probability instantly take to flight.

'At the lek, the cocks most commonly fall the sacrifice; for the hens, as well from their colour more resembling the foliage of the trees, as from the sportsman having larger and better game in view, usually escape. This is a fortunate circumstance; as were a proportionate slaughter to take place among the latter as the former, the breed in many parts of the Scandinavian peninsula would soon be exterminated.

'In following this amusement, accidents have occurred. In the gloom of the morning or evening, it has happened that whilst a person has been stealing silently forward among the trees, he has been taken by others engaged in the same pursuit for a wild beast, and in consequence a ball has been sent whistling after him. I heard of one man who in this manner was shot through the body.

'The number of capercali a man may shoot in a given period by the above means, depends altogether upon circumstances. Indeed it often happens that in countries abounding with those birds, from the state of the weather, there being a crust upon the snow, &c., the most experienced chasseurs will hardly kill a single one for days together. I have however heard people assert they have bagged as many as six or seven in the course of the morning and evening of the same day: but one or two is a much more usual number. A peasant in the interior, who devotes a good deal of time to the purpose, will, if he understand what he is about, commonly kill from fifteen to twenty: and in one instance I remember hearing of twenty-nine in the course of the season. This, in a country where every one carries a gun, will give an idea of the havoc that is made among the capercali, and readily explains their present (as I contend) scarcity.

'Though this plan of shooting the capercali during the spring is common throughout most parts of Scandinavia, I am told, that in Norrland and Wästerbotten, from whence Stockholm is furnished with its principal supplies of game, that destructive practice is not generally adopted. This arises from the people in those districts having sense enough to know, that if they kill too many of the cocks in the spring, there is little probability of there being a good breed during the succeeding autumn.

'The capercali occasionally strikes up a few notes, in the manner of which I have spoken, during the autumnal months,—about Michaelmas, I believe. For this it is perhaps difficult to assign a reason. Mr. Greiff suggests "that it may be to show the young birds where the *lek* is situated." I have never myself heard the capercali playing at this period of the year; but I have met with men, on whose word I am inclined to place confidence, who have repeatedly killed them at that time whilst so occupied.

'Though so many of those magnificent birds are destroyed by the unsportsmanlike means which I have just described, it rarely happens that more than one of them is killed at a shot; indeed I never heard of but a solitary instance, where as many as three were destroyed at a single discharge. This I am aware is a little at variance with the statement of other Scandinavian travellers: one among them says, "In that season (the spring) the peasant, at an early hour of the morning sallies forth into the forest, armed with his fowling-piece, and listens attentively for the voice of the cock, which, perched on a lofty pine, brings the hens together from all parts; the other cocks likewise repair to the spot, and, instigated by love and jealousy, a furious battle commences, during which they are so deeply engaged, and so inattentive to their own safety, that the gunner will frequently kill no less than a dozen of these large birds at a shot." Of course it is not for me to contradict this statement, though, independently of its not being usual for the capercali to engage in such battles-royal as are here described, it would seem to require a gun of no ordinary calibre to slaughter at a single discharge a dozen birds, each of which is pretty nearly as large as a turkey-cock.

'"The traveller to whom I have just alluded, in speaking of the capercali, in another part of his work says, "The difficulty of finding their eggs is so great, that the peasants even seem to consider it in a manner proverbial; and I never met with one of them who had either seen the same or discovered a nest." This may be the case, for all I know to the contrary, in other parts of Scandinavia; but in Wermeland and the adjacent provinces, at all events, it was no unusual occurrence for people to fall in with both one and the other.

'The same author, in describing the play of the capercali, has, I apprehend, committed a mistake, for he says, "His note, though extremely varied during the breeding-season, consists principally of an extremely loud hissing kind of cooing, which may be heard for a considerable distance around." Now, this description, which would not inaptly apply to the black-cock, is certainly as opposite as light is from darkness to the play of the capercali.'

Chace.—Our limits will not permit us to enter into the details of the more legitimate chace, which will be found in Mr. Lloyd's book: suffice it to say that the rifle is the instrument used by the fair sportsman, and that, in the course of his sport, Mr. Lloyd observed that when the weather is cold, and the snow loose and soft, the capercali not unfrequently buries himself beneath its surface during the night season, and once in a while he found the bird in that situation in the day-time: so that the old wood-cuts of grouse nestling under the snow are not entirely without foundation. Mr. Lloyd remarks that the capercali often becomes the prey of the great horned owl. [BUBO.]

Utility to man.—As an article of food the capercali is justly admired; and the rapidity of communication consequent upon the increased and increasing development of the powers of steam, now furnishes annually the shops of the London poulterers with a supply in the spring. Some assert that at certain seasons the flavour of the bird is rendered extremely unpleasant by the fir buds which then form its food; but those which we have tasted were excellent. The hen, though smaller, is in our opinion preferable to the cock. In preparing the bird for roasting, the breast should be skinned and a veal caul spread over it.

Description.—*Male.*—Elongated feathers of the throat black: the rest of the head and neck ashy black; eyebrows red; wings and scapulars brown, sprinkled with small black dots: breast changeable green; belly and abdomen black, with white spots; rump and flanks sprinkled with ashy zigzags on a black ground; tail feathers black, with some small white spots disposed at about two inches from their extremities; bill nearly three inches long, very strong, hooked, and of a whitish horn colour; iris clear brown; length about 2 feet 10 inches: usual weight from 9 to 12 lbs. Graves says that the fine specimen from which his figure was taken measured [illegible] feet 1½ inch in length, 7 feet 5 inches in breadth [illegible] 15 lbs. 2½ ounces.

Female [illegible] striped [illegible] and spotted with red or bay, black and [illegible] feathers [illegible] of the head bright ruddy, and those of the b[illegible] de [illegible]; tail ruddy, striped with black; bill blackish brown; size about one-third less than that of the male.

Young males, after their first moult.—Breast of a less lustrous green than in the old birds, and the ash-colour predominating over the black; some red feathers spotted with black are scattered irregularly over the plumage. Before the first moult the young males resemble the females.

N. B. There are some anatomical differences between the form and extent of the trachea of the male and that of the femal

HYBRIDS.

Mr. Lloyd says that the capercali occasionally breed with the black game; the produce of which are in Sweden called Racklehanen: these partake of the leading characters of both species; but their size and colour greatly depend upon whether the connexion was between the capercali cock and the grey hen, or *vice versâ*. 'Out of twenty racklehanar, which is the male, two, according to Mr. Falk, are not alike; and the difference of colour observable among the rackle-hönan, which is the female, but very rare, is still greater. Racklehanen are very seldom to be met with. During my stay in Wermeland, however, Mr. Falk had two of these birds in his possession, and I myself shot a third.' The bird here alluded to was probably the rakelhan (*Tetrao medius* of Meyer), which Temminck observes, some naturalists, and recently M. Nilsson, have erroneously considered a hybrid between the capercali and black cock. But at Braemar, in 1828, in consequence of the death of the hen which had been imported with a cock, a common barn-door hen was introduced to the latter. The result, according to Mr. Wilson, was, that she laid several eggs, which were placed under other hens; but from these eggs only a single bird was hatched, and when it was first observed it was found lying dead. It was however an evident mule or hybrid, and showed such unequivocal marks of the capercali character as could not be mistaken.

[Tetrao Urogallus. Male.]

CAPERNAUM, an antient city of Galilee in Palestine, about seventy miles N. by E. from Jerusalem. It is situated on the north-western shore of the Sea of Tiberias. It was a place of considerable importance in the time of Christ, who describes it as 'exalted unto heaven.' The place derives its chief interest from the manner in which it is mentioned in the New Testament. It was there that Jesus Christ commenced his public ministry; and in its neighbourhood he delivered the Sermon on the Mount. Its continued impenitency and unbelief, notwithstanding the peculiar opportunities with which it was favoured, l [illegible] the denunciations pronounced against it. No town now exists on the spot which is usually recognized as the Capernaum of Scripture. This place is now called *Tel-Houm*, *Tal-Heun*, or *Tel-Hoohm*, according as travellers variously pronounce the Arabic name, near which the rivulet El Eshe empties itself into the Lake of Tiberias. The view of the lake from this place is peculiarly grand and impressive. Capernaum is now only a Bedouin station; but the former existence of a town of some importance is proved by fragments of buildings, hewn stones, and broken pottery, strewed to a considerable extent around. The foundations of a large and magnificent edifice may still be seen; but not enough of the building itself to determine whether it was a temple or a palace.

CAPET, HUGUES, the founder of the third, or, as it has been called from him, the *Capetian* dynasty of French princes, of whom little authentic information is preserved. The monks indeed speak of a vision which informed him that the translation of the bones of St. Riquiec from Flanders to the confessor's own monastery at Centule, should be rewarded by the crown of France for himself, and its duration in his family till the seventh generation. His own great fief, as Count of Paris, gave him considerable predominance; and on the death of the last of the Carlovingians, A.D. 987, Louis V. the Slothful (*Le Fainéant*), he successfully usurped the throne, and was confirmed in its seizure by the confederacy of turbulent barons, who yielding him as much obedience as it suited them, invested him with the nominal title of king. What remains to be told of Hugues Capet after his accession belongs entirely to general history. The origin of the name of the family has been disputed, and indeed by some has been considered as given in ridicule; but the chroniclers in general affirm that he was a knight of antient and noble extraction, and the imputation of plebeian birth which has been advanced against him is manifestly founded upon a misconstruction of a well-known line in the *Purgatory* of Dante, canto xx., in which that poet satirically makes the usurper declare of himself—'I was the son of a butcher of Paris.' The commentators explain this line by adding, that Hugues the Great, Count of Paris, the father of Hugues Capet, was a rigid executioner of the sentences which he had passed. M. de Sismondi, *Hist. des Français*, iv., 38, has shown that Velly is not to be trusted in his account of the family of Capet; but the reader may be safely referred to M. de Sismondi himself, to the Preface to the third volume of the great collection, generally known under the name of Bouquet, or to the *Preuves de la Généalogie de Hugues Capet* in *L'Art de vérifier les Dates*, i. 566.

A single anecdote may suffice to show the little authority which Hugues possessed over his vassals. 'Who has made you count?' was the inquiry which he directed a herald to put to Aldebert de Perigueux, who had assumed the title of Count of Poictiers and of Tours. 'And who has made you king?' was the only reply which Aldebert vouchsafed to return by the same messenger. As a supposed atonement for the illegitimacy of his accession, Hugues himself never wore the crown. Some have stated that, by abstaining from this bauble of royalty, he hoped to obtain the addition of *one* generation to those which had been prophesied to him. Both the dates of his usurpation and of his death are uncertain, but the former is usually fixed in A.D. 987; the latter A.D. 996. Thirteen kings (fourteen if we include John, who lived but eight days, and was never crowned) succeeded from his family: and it was not until 1328, that Philip VI. of Valois transferred the sceptre to his own most detestable race.

The family of Lorraine, which had been excluded by Hugues Capet when he put aside the right of Charles Duke of Lorraine, uncle of Louis V., proudly boasted of their Carlovingian origin; and the party name Huguenot, which arose during the wars of the League, has sometimes been attributed to the attachment manifested by the reformed to the reigning king, the representative of Hugues Capet, in preference to the Guises, who were derived from Charlemagne. On the accession of the line of Bourbon, the name was either adopted by them or given to them; and all the processes in the trial of the unfortunate Louis XVI. were directed against Louis Capet.

CAPERS, the young flower-buds of *Capparis spinosa*. [CAPPARIDACEÆ.]

CAPIAS. This term denotes in law certain writs so called from the occurrence of the word (capias) in the antient Latin forms:—

1. *Capias ad respondendum.* This is a judicial writ by which all *personal* actions (that is, such as do not relate to land or real property) are commenced in the superior courts of common law against any person whom it is intended to arrest or hold to bail, and who is not already in custody.

Since the passing of the Uniformity of Process Act (2 Will. IV. c 39), the force of the writ of *capias ad respondendum* therein prescribed is the same in all the courts; and it is also the actual commencement of the action. In form it is a command from the king to the sheriff to take the defendant if he shall be found in his bailiwick, and him safely keep until he shall have given bail, or made a deposit according to law in a specified action at the suit of the plaintiff, or until the defendant shall by other lawful means be discharged from custody. The sheriff is also required to deliver a copy of the writ to the defendant; and the defendant is enjoined to take notice that within eight days after the execution of it he must cause special bail to be put in for him in the court from which the writ is issued. The sheriff is also commanded to make his return to the writ immediately after he has executed it, stating the day of such execution; or if not executed within four calendar months from the date, then that he also return it, or sooner, if lawfully required to do so. It is witnessed in the name of the chief judge of the court from which it issues, and is dated on the day it issues.

2. *Capias ad satisfaciendum*, usually called a *ca. sa.* This is a writ of execution to imprison the person of the defendant after judgment has been obtained against him,

until he make satisfaction to his creditor. It commands the sheriff to take the defendant, and him safely keep, so that he may have his body in court on the return of the writ to satisfy the plaintiff. This writ must strictly pursue the judgment upon which it is founded; that is, in a judgment against two persons, the *ca sa* cannot issue against one only, unless the other be dead; nor can it be sued out for a larger sum than has been *recovered* against the defendant.

Formerly it was the practice to *teste* (that is, date it) in Term time, but now it may be *tested* on the day on which it is issued (3 and 4 Will. IV. c. 67, s. 2). It may also by that act be made returnable immediately after the execution, instead of waiting until the ensuing Term, which was often productive of great loss and delay; nor is it now necessary that any certain number of days should elapse between the *teste* and the return. Where the sheriff can do so, he ought regularly to return, by indorsement on the back of the writ, the manner in which he has executed it; for instance, that he has either taken the defendant and has his body ready, or that the defendant is so ill that he cannot be moved, or that he is not to be found in his bailiwick; in which latter case another *capias*, called a *testatum capias*, may issue into another county; but it is not usual in practice for the sheriff to return the writ unless called upon to do so by a rule of court. The writs, when returned, are filed with the *custos brevium*, and a sheriff is answerable in damages to the plaintiff for making a false return.

Every writ of *ca sa* should be indorsed with the party's addition and residence, or such other description as the plaintiff may be enabled to give, together with the amount of the debt which the sheriff is to levy: the plaintiff at his peril indorses more.

The mode of executing this writ is generally the same as in the case of a writ of *capias ad respondendum*.

The effect of taking a party in execution upon a *ca sa* is, that it operates at once as a satisfaction of the debt, and no other writ of execution can be sued out upon the same judgment against the defendant's goods or lands, unless he die in confinement or escape from custody.

3. *Capias ad satisfaciendum to fix the bail.*—Where bail have been given in the original action, they stipulate in this triple alternative, that the defendant should, if condemned in the suit, satisfy the plaintiff his debt and costs; or that he should surrender himself a prisoner, or that they should pay the debt for him. [BAIL.] Where therefore the defendant is at large after the judgment, and the bail are responsible, it is often of importance to fix them with the debt; for this purpose a *ca sa* must first be sued out against the principal, upon which the sheriff must return that he is not to be found, for the bail are not bound to render their principal until they know by the plaintiff's suing out this writ, that he means to proceed against the person of the defendant and not against his goods [EXECUTION]; and for the purpose of affording the bail this information, the writ must lie in the sheriff's office four clear days before the return, and be entered in a book kept for that purpose. It must be directed to the sheriff of the county where the action was tried. The sheriff returns that the defendant is not to be found as a matter of course, without even attempting to take him (except where he is actually in his custody) as the *ca sa* is merely intended as a notice to the bail of the plaintiff's intention to proceed against them; and if they do not render their principal in time, the plaintiff may proceed for the debt against the bail.

4. *Capias utlagatum* is a writ that lies against a person who has been outlawed in any action. It is either general or special; the former against the person only, the latter against the person, lands, and goods. (Stat. 2 W. IV., c. 39, s. 5.) [OUTLAWRY.]

5. *Capias pro fine*, the name of an antient writ now obsolete, by which the defendant who had judgment given against him might in some cases be arrested for his wilful delay of justice until he paid a fine to the king for the same.

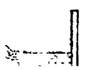
6. *Capias in withernam* was a writ, now obsolete, which lay where a distress taken was driven out of the county, so that the sheriff of that county could not deliver them to the party applying to have them replevied. [DISTRESS, REPLEVIN.]

(Tidd's *Practice*; *Index, tit. Capias*; Archbold's *Practice* by Chitty.)

CAPILA. [SANKHYA.]

CAPILLARY ATTRACTION and REPULSION. These names have been given to the properties of matter which cause the ascent or descent above or below the level of the surrounding fluid which takes place when a tube of very small diameter (like a hair, *capillus*) is dipped into water, mercury, &c. This phenomenon, which excited early remark from its peculiarity and apparent exception to all the laws which regulate the equilibrium of fluids, has given its name to what is rapidly becoming an extensive and well connected theory of the action of the parts of solids and fluids upon each other. We shall however in this article confine ourselves to the description of phenomena which are strictly capillary, in the original sense of the word, referring to MOLECULAR ATTRACTION for an account of the general theory which explains these phenomena as particular cases of a more extensive class. Our reasons are, 1. The improper use of language which exists in comprehending so extensive a range of phenomena as are contained in the theory in question, under a term which is derived from a very limited and special class of experiments: 2. Our general plan of confining articles on questions of physics to the leading points connected with the name at the head of the article: 3. The consideration that the whole of this theory is in a state of such apparent progression that a very short time may materially increase its extent.

That solid substances, either directly or by means of some interposed agent [ATTRACTION], attract each other, or endeavour to produce motion in each other, has been abundantly demonstrated both by celestial and terrestrial phenomena. That the parts of solids exercise force on each other is evident from the force which is required to separate them. [COHESION.] That the parts of liquids exercise a feeble action of the same kind is also sufficiently obvious. And the common property of most fluids with respect to solids, namely, that the former *wet* the latter, is proof of a similar connection between solids and fluids. If glass be dipped into water and then drawn out, a portion of the fluid is drawn out with it, some of which hangs from the bottom of the glass. Here is sufficient proof of a force which overcomes the weight of the fluid; whatever may be its cause or mode of action, there is an attraction of the particles of the water to those of the glass; but the every-day character of the phenomenon did not excite much attention until the appearance of the same kind of effect in a peculiar form, namely, that of capillary attraction, made the experiment a *philosophical* one.

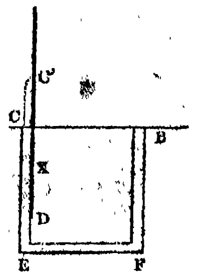


The preceding diagram represents the appearance (in section) of a fluid into which a tube of very small diameter is plunged enlarged for the sake of distinctness. The fluid either rises or sinks in the tube above or below the level of the exterior; and at the same time is slightly curved at what would be, were it not for this curvature, the exterior *level* immediately adjoining the tube. It is also to be observed that in cases where the fluid stands higher within the tube than without, its upper surface is always concave; but that when the fluid is lower within the tube, it is convex: both appearances are represented in the diagrams. When the solid is one which can be wetted by the fluid, the elevation and concavity are observed; but when the solid appears to repel the fluid, the depression and convexity are observed. Glass and water furnish an instance of the first; glass and mercury of the second. Thus the bulbous appearance of the top of the mercury in a barometer is a phenomenon of the kind represented in the second diagram [BAROMETER]. The different appearances presented by water and mercury with respect to glass may be thus stated. A drop of water upon a level piece of glass becomes hemispherical or nearly so, and adheres: a very small drop of mercury retains its spherical form, and rolls easily. It is not true that the glass actually repels the mercury; M. Gay-Lussac found that a disc of glass of 120 millimetres (4 inches 7 tenths) in diameter required a separating force of from 150 to 300 grammes (a pound avoirdupois is 453½ grammes) to detach it from the surface of a bath of mercury. The inference is that the attraction of the particles of mercury upon mercury is stronger than that of the particles of glass upon mercury, but that the action of glass upon water is stronger than that of water upon water.

The laws according to which the fluid rises or falls have been experimentally determined, and are also found to be deductions from the theory which has been proposed for their explanation. They are as follows:—1. The action of the fluid or solid, of what kind soever it may be, is sensible for a very small extent only thus a tube of dry glass, and the same tube previously wetted throughout its whole interior with the fluid to be examined, cause different amounts of elevation. In the first case, when the equilibrium is established, the particles in immediate connection with the top of the concavity are of glass: in the second case they are of water, and we are in fact immersing a small tube of *water* into water, the glass being merely an outer case, on which the water is deposited. The action of the glass appears not to extend the depth of the thin film of water which comes into immediate contact with the water from the vessel. And it is found that whatever the substance may be which serves as a case for the film, the elevation is the same. 2. When cylindrical tubes of different diameters are compared, the elevation is inversely proportional to the diameter: namely, that in a glass tube of $\frac{1}{100}$ of an inch in diameter water stands twice as high as in one of $\frac{1}{50}$ of an inch; and so on. According to the experiments of M. Gay-Lussac, a wet tube of one millimetre in diameter causes an elevation of 29·79 millimetres of water; and a tube of glass of two millimetres in diameter causes a depression in mercury of 4·58 millimetres. 3. Whatever the form of the tube may be, the elevation or depression is found to depend only upon the diameter at the upper part of the elevation, in this manner, for instance: if a small conical tube widening downwards be dipped into a fluid which is found to rise in it to an elevation at which the tube has a diameter of $\frac{1}{100}$ of an inch, then if a cylindrical tube of $\frac{1}{100}$ of an inch were immersed in the same fluid, the water would rise to the same height as in the conical tube. 4. If the tube be double (one tube within another) the fluid rises to the same height in the interval between the two tubes, as it would do in a tube with that interval for its radius. 6. Between two parallel plates immersed at a very small interval the fluid rises as high as in a tube with that interval for its radius. 7. Between two plates vertically placed, but inclined at a very small angle (like a double screen nearly closed) the fluid rises higher and higher as we proceed towards the upright line of junction: and the curve of the upper surface of the fluid is an hyperbola. Assuming the principle rendered probable in (1), namely the extreme smallness of the extent to which molecular forces act sensibly, all the remaining facts are deductions from theory as well as results of experiment.

We shall not give a table of the results obtained by different experimenters, because they vary considerably as to amount, though in the results of the same observer, the fact marked (2) in the preceding list generally appears very near the truth. The discrepancy possibly arises from the various degrees of internal moisture in the tubes. Experiments have been made from the time of Newton, but it is only since the application of the molecular theory by Laplace that it seems to have been always admitted and acted upon, that the internal coating of the tube immediately adjacent to the fluid is the cause of the phenomenon. The results of various observers upon glass and water give elevations of from two to five inches in a tube of one-hundredth of an inch: the result of M. Gay-Lussac (who always observed with moistened tubes, and found all his experiments agree very nearly with each other) gives an elevation of 4·62 inches for the same diameter. The elevations of fluids vary also with the temperature, the former diminishing as the latter increases.

We shall conclude this article with considerations which may give readers who cannot study the mathematical theory a notion of the manner in which the phenomena may be supposed to arise, referring to MOLECULAR ATTRACTION for some account of the different modifications which the theory has undergone. But as it must add materially to the interest which attaches to any theoretical description, to know how far the results coincide with experiment, we shall cite the following from a very complete account of the progress of investigation on this subject, the 'Report on the Theory of Capillary Attraction,' by Professor Challis, *Rep. Brit. Ass.* for 1831, p. 253. From observations of the elevation of water, alcohol, and oil of turpentine, in tubes of white glass, the forces necessary to elevate a disc of the same substance 118·366 millimetres in diameter were *theoretically* deduced, and found to be 59·59, 31·14, and 34·35 grammes for the three fluids. Experiment determined the same forces to be 59·40, 31·08, and 34·10 grammes.



The tube being immersed in the fluid, of which the natural level is A B, let us consider a small canal of fluid C D E F B. The glass immediately above C exercises an uncompensated attraction on the fluid; but at any point X between C and D, the action of the glass is equal upwards and downwards, so that there is no further disturbance till we come to D, where the side of the canal ceases to be of glass, and becomes of fluid. There is then at D the difference of the actions of the glass and fluid, *downwards*, if the action of fluid on fluid be the stronger; *upwards*, if that of glass on fluid be the stronger. We suppose the actions to extend to very small distances only. But the counterpoising column B F is in its natural state. If then twice the action of the glass on the fluid (namely those exerted at C and D) exceeds that of the fluid on the fluid at D, a part of the weight of the column C D is counterbalanced by the excess of upward pressure, and this column, so relieved, cannot counterbalance the weight of B F, unless its length is so increased that the excess of length may counterpoise the upward pressure. The fluid immediately adjoining the side will therefore rise, and the same all round the interior of the tube. But so long as the cohesive quality of the fluid exists, the fluid still more in the interior of the tube will also rise, and this will continue until the whole body of fluid raised is a counterpoise to the inequality of the actions. Similarly, if the action of the fluid at D exceed those of the glass at C and D, there will be a downward pressure equivalent to an increase of weight in the column C D. That column therefore will fall, and with it the columns still more in the interior. This explanation, though exceedingly imperfect, will serve to give the first notion on the subject: and the following experiment tends to confirm it. If the tube be filled with fluid, and then held vertically with the lower opening stopped by the finger, which is then gently removed, some of the fluid will drop out, but a column will remain suspended in the tube, ended by a hanging drop from the lower extremity. And it is always found that the length of this column is considerably greater than the elevation when the tube is immersed in the fluid: in fact, the action of the fluid below D on the right is now removed, or a pressure downwards is removed, consequently a longer column is required to counterbalance the actions of the glass at C′ and D.

In consequence of the minuteness of the tubes which are required to produce sensible effects, very few can actually make experiments on this subject for their own instruction. But a lump of white sugar or a fine sponge, either of which is a collection of minute tubes, held with the lower end slightly immersed, will immediately cause an ascent of the fluid.

The elevation of the fluid being always accompanied by convexity, and the depression by concavity, a use of words prevails in philosophical treatises which is excessively embarrassing to the learner. It is said the concavity causes the elevation, and the convexity the depression. It is true that when two phenomena always appear together, and one being given the other may be found, either may be treated mathematically as the cause of the other. But this doctrine of *mathematical* causes [ATTRACTION] is inconvenient to all but mathematicians, when, as in the present case, there is a physical agent of a different kind certainly present. With a warning, however, as to the use of the word cause thus introduced, the inconvenience may be diminished or altogether destroyed.

CAPILLARY VESSELS, so called from their hair-like minuteness. The blood-vessels of the body consist of arteries and veins, the arteries carrying blood from the heart, and the veins returning it to the heart. It has been shown [Artery] that the arterial system is arborescent, that is, that the branches which spring from the aorta successively increase in number and diminish in size as they proceed from the heart towards their ultimate terminations in the system. These ultimate terminations of the arteries, together with the first origins of the veins, constitute a peculiar system of vessels termed the *capillary* system. These capillary vessels are too minute to be detected by the naked eye; but in the transparent parts of the body of a living animal, when brought under the field of the microscope, they become perfectly visible, as in the web of the frog's foot and the mesentery of the rabbit. The greater number of the arteries and veins are then seen to be directly continuous with each other, no substance intervening between the two orders of vessels. No words can describe the beauty of the sight presented by the flow of the vital fluid through these minute tubes. Myriads of vessels not visible to the naked eye instantly come into view. In one case the direction of a minute artery being suddenly altered it is reflected on itself, and thus becomes an incipient vein; in other cases minute branches are sent off from an artery into a parallel vein; and in a third case several minute arterial ramifications are continuous with a single vein. The venous capillaries are generally larger and more numerous than the arterial, and they communicate more freely with each other.

The minute capillary vessels are totally distinct both in structure and office from the large trunks from which they spring. All the tunics of the capillary arteries diminish in thickness and strength as the tubes lessen in size, but more especially the middle or fibrous coat [Artery], 'but this coat may still be distinguished by its colour in the transverse section of any artery whose internal diameter is not less than the tenth of a line: but it entirely disappears in vessels too small and too remote to receive the wave of blood in a manifest jet. But while the membranous tunics diminish, the nervous filaments distributed to them increase. The smaller and thinner the capillary the greater the proportionate quantity of its nervous matter; and this is most manifest in organs of the greatest irritability. The coats of the capillaries successively becoming thinner and thinner at length disappear altogether, and the vessels ultimately terminate in membraneless canals formed in the substance of the tissues.'

Of the capillary arteries which it has been stated terminate by direct communication with the capillary veins, 'some are large enough to admit of three or four of the red particles of the blood [Blood] abreast; the diameter of others is sufficient to admit only of one; while others are so small that they can transmit nothing but the serum of the blood. As long as the capillary is of sufficient magnitude to receive three or four particles abreast, it is evident that it possesses regular parietes; but by far the greater number before they communicate with veins lose altogether their membranous coats. There are no visible openings or pores in the sides or ends of the capillaries by means of which the blood can be extravasated preparatory to its being imbibed by the veins. There is nowhere apparent a sudden passage of the arterial into the venous stream, no abrupt boundary between the division of the two systems. The arterial streamlet winds through long routes, and describes numerous turns before it assumes the nature and takes the direction of a venous streamlet. The ultimate capillary rarely passes from a large arterial into a large venous branch.'

All the great organic functions of the living body are performed mainly by the capillary arteries. Their action is essential to secretion, nutrition, calorification, and every other process which is indispensable to the support of life. Accordingly it is found by direct experiment that these vessels possess an active contractile power altogether independent of the impulse derived from the heart. Under the ordinary condition of the circulation, the blood indeed flows through these capillary vessels by the force communicated to the circulating fluid by the contraction of the heart; but the evidence is indubitable that stimulants of various kinds applied directly to the capillary arteries, without in the least the heart's action, are capable of modifying to a [illegible] extent the action of the capillaries; sometimes, for example, causing them to contract and at other times to dilate; sometimes quickening the flow of the blood through them; at other times retarding it, and frequently altogether arresting its progress. It is manifest that this contractile power of the capillaries must be a vital endowment, for no such property is possessed by any substance destitute of life; and there is satisfactory evidence that it is communicated, regulated, and controlled by the organic nerves, which it has been stated increase as the size of the vessels and the thickness of their membranous coats diminish. 'The powerful influence of these nerves upon the capillary vessels is placed beyond doubt or controversy by the obvious local changes produced in the capillary circulation by sudden and even by mental impressions; by the flush of the cheek and the sparkle of the eye at a thought conceived or a sound heard; changes which can be effected, as far as we have any knowledge, by no medium excepting that of the nerves.'

Of the real nature of the phenomena which take place in the capillary vessels we are wholly ignorant; but it is probable that they consist of the conjoint operation of mechanical, chemical, and vital actions, the combined influence of which on the constitution of the blood, the pabulum of life, in the primary and essential functions of life, is thus stated by the author of the 'Philosophy of Health:'—

'Exerting upon each other a vital force of repulsion, under a vital influence derived from the organic nerves, urged by the vital contraction of the heart, the particles of the blood reach the extreme capillaries. Most of these capillaries terminate in canals, which they work out for themselves in the substance of the tissues. The tissues are endowed with a vital attractive force, which they exert upon the blood—an elective as well as an attractive force; for in every part of the body, in the brain, the heart, the lung, the muscle, the membrane, the bone, each tissue attracts only those constituents of which it is itself composed. Thus the common current, rich in all the proximate constituents of the tissues, flows out to each. As the current approaches the tissue the particles appropriate to the tissue feel its attractive force, obey it, quit the stream, mingle with the substance of the tissue, become identified with it, and are changed into its own true and proper nature. Meantime the particles which are not appropriate to that particular tissue, not being attracted by it, do not quit the current, but, passing on, are borne by other capillaries to other tissues to which they are appropriate, and by which they are apprehended and assimilated. When it has given to the tissues the constituents with which it abounded, and received from them particles no longer useful, and which would become noxious, the blood flows into the veins to be returned by the pulmonic heart to the lung, where, parting with the useless and noxious matter it has accumulated, and replenished with new proximate principles, it returns to the systemic heart, by which it is again sent back to the tissues.

'Particles of blood are seen to quit the current and mingle with the tissues; particles are seen to quit the tissues and mingle with the current. But all that we can see with the best aid we can get does but bring us to the confines of the grand operations that go on, of which we are altogether ignorant. Arterial blood is conveyed by the arteries to the capillaries; but before it has passed from under the influence of the capillaries, it has ceased to be arterial blood. Arterial blood is conveyed by the carotid artery to the brain, but the cerebral capillaries do not deposit blood, but brain. Arterial blood is conveyed by its nutrient arteries to the bone; but the osseous capillaries do not deposit blood, but bone. Arterial blood is conveyed by the muscular arteries to muscle; but the muscular capillaries do not deposit blood, but muscle. The blood conveyed by the capillaries of brain, bone, muscle, is the same; all comes alike from the systemic heart, and is alike conveyed to all tissues: yet in the one it becomes brain, in the other bone, and in the third muscle. Out of one and the same fluid these living chemists manufacture cuticle, and membrane, and muscle, and brain, and bone; the tears, the wax, the fat, the saliva, the gastric juice, the milk, the bile, all the fluids and all the solids of the body.

'And they do still more, for they are architects as well as chemists; after they have manufactured the tissue they construct the organ. The capillaries of the eye not only form its different membranes and humours, but arrange them in such a manner as to constitute the optical instrument; and the capillaries of the brain not only form cerebral matter, but build it up into the instrument of sensation, thought, and motion.' (See Dr. Craigie's *General Anatomy*; Grainger's *Elements of General Anatomy*; Dr. Southwood Smith's *Philosophy of Health*.)

CAPITAL. In the article ACCUMULATION we have shown the manner in which *savings* become *capital*,—or accumulations capable of producing profit. The surplus of production which remains, either in the shape of national or individual wealth, after a portion of what is produced has been consumed, is capital; and this capital, conjoined with new labour, produces a further surplus or profit. The capital of an industrious nation, having its industry developed under wise institutions, is thus constantly increasing. It will not be convenient, in this place, to enter into any minute details having reference to the various forms in which capital is accumulated, or to show its operations in the creation of profit in conjunction with labour. As far as such large subjects, which involve minute illustrations, can be properly treated in a Cyclopædia, they are noticed under the heads of INTEREST, PROFIT, RENT.

CAPITAL. [COLUMN.]

CAPITANA'TA, a province of the kingdom of Naples corresponding to the antient Daunia or original Apulia, for the Apulia of the Romans was more extended, and included also Peucetia the present Terra di Bari. [APULIA.] The word Capitanata is a corruption of Catapanata, a word derived from catapan, the name given to the Greek or Byzantine governor of this province under the eastern emperors. The province is also vulgarly called Puglia Piana, to distinguish it from Puglia Pietrosa or Terra di Bari and Otranto. Capitanata is bounded N.E. by the Adriatic, N.W. by the Sannio (formerly Contado di Molise), from which it is divided first by the upper course of the Fortore, and lower down by the small river Saccione, half way between the Fortore and the Biferno. Until of late years the limits of Capitanata extended beyond the Biferno to the boundaries of Abruzzo Citra near the mouth of the Trigno: but, by the new limitation of the provinces, the maritime district of Termoli, on the left bank of the Biferno, and that of Ururi on the right bank of it, have been added to the Sannio. To the S.W. Capitanata is bounded by Principato Ultra, from which it is divided by the central Apennine ridge, and to the S.E. by Basilicata and Terra di Bari, being divided from both by the course of the Ofanto. The length of the province from the mouth of the Saccione to that of the Ofanto is 80 miles, and its breadth from the pass of Bovino to Manfredonia is about 50 miles. The greater part of Capitanata consists of a wide plain sloping gently from the foot of the Apennines to the Adriatic. In the N. part of the province the insulated group of Mount Gargano projects eastwards into the sea, forming a peninsula, which from its shape and position has been called the Spur of Italy. To the N.W. the districts of Torre Maggiore, Lucera, and Vulturara, lie among offsets of the Apennine ridge. To the W. the towns of Troja and Bovino, and to the S. that of Ascoli rise at the foot of the ridge itself. [ASCOLI DI SATRIANO.] All the rest is a vast monotonous plain, without trees, with hardly any villages or houses, and with only the town of Foggia in the middle of it, and the small town of Cerignola, 25 miles S.E. of Foggia, near the Ofanto. This plain is known by the name of Tavoliere di Puglia. The chief rivers are, the Fortore, which enters the sea near Lake Lesina; the Celone and Candelaro, which are formed of several branches rising in the Apennines and in the offset which fills up the peninsula of Gargano, these two rivers afterwards uniting in one stream under the name of Candelaro, which enters the Lago Salso a little S. of the town of Manfredonia; and the Cervaro and Carapella which unite near the sea a few miles N. of Lake Salpi. The Ofanto (the Roman Aufidus) is the largest river of the province. It rises in the central Apennines about twenty-five miles N.E. of Salerno, on the opposite coast, and enters the sea after a rapid course of about sixty miles.

The surface of Capitanata is 2359 square miles, forming 2,387,780 moggia (the moggia is somewhat less than the English acre), divided among 42,000 proprietors (many of them only house proprietors), out of 273,000 inhabitants. The number of proprietors has been decreasing during the last ten years; in 1824 they were 57,500. About one-sixth of the surface, among the hilly regions of Gargano and the Apennines, is covered with forests and plantations of trees. The great plain of the Tavoliere occupies 1,120,000 moggia, or nearly one-half of the surface of the province. Two-thirds of this plain are left for pasture and have no resident population, and the other third is cultivated, excepting 48,000 moggia of it, which are covered with marshes. The history of the Tavoliere is interesting. Daunia, pr [illegible] the Roman invasion, was well inhabited, and had many towns. In the second Punic war the devastation of the country was commenced. The wars of Sulla and the servile war of Spartacus completed the desolation. The towns and villages of the plain being destroyed, the inhabitants became wanderers and shepherds. The course of the rivers and the drains being neglected, pestilential marshes were formed near the sea coast, while the inland plain, deprived of irrigation, was burnt up by the summer heats. In winter, however, it afforded a natural and abundant pasture. The mountaineers of Samnium and Abruzzo, whose countries had also suffered their share of Roman devastation, being mostly reduced to the condition of shepherds, began to lead their flocks in winter into the plains of Apulia, which were abandoned, and returned to the mountains for the summer. This was the origin of the 'pastorizia errante,' or the system of migratory pasturing, which has continued ever since. The Romans established a *vectigal* or gabella upon the flocks and cattle which were led to pasture in the plain, and intrusted its management to Publicani called 'Alabarchi,' who numbered the heads of cattle or sheep, and collected the tax. (See Ducange's *Glossarium*, art. 'Alabarchi.') Under the emperors the complaints of the extortions of the Publicani became so loud that Nero proposed to the senate the abolition of the vectigal, which however was not effected. Things continued in the same state for centuries after the fall of the empire. The towns of Salapia, Argyrippa, Anxanum, Herdonia, &c., had disappeared. Sipontum still survived in a state of decay until the Norman Manfred removed its inhabitants to the new town of Manfredonia. Under the Normans the Tavoliere was made a fiscal or royal property, and parts of it were let to 'locati' or tenants. Charles of Durazzo drove away the tenants. Alfonso of Aragon, by letters-patent, dated from Tibur 1st of August, 1447, organized anew the gabella on the sheep and cattle, by which the proprietors of flocks in the mountains of Samnium and Abruzzi were obliged to take them into the plain of Puglia for the winter, and to pay a tax at so much per head.

In 1661 this obligatory migration was commuted into a voluntary one, by which every proprietor of flocks obtained the quantity of ground that he wanted for pasture, by paying to the treasury 132 ducats a year for every 1000 sheep. Other parts of the plain were let for cultivation. Under King Joseph Bonaparte, in 1806, all the temporary tenants of the Tavoliere were obliged to become enfiteuti, or perpetual tenants, and to purchase their lease; under which regulation 1,800,000 ducats were paid at once into the treasury. In 1817, after the restoration, a second fee to the same amount was exacted, and the annual charge was also raised; at the same time the peace lowered the price of agricultural produce. A hail-storm in 1822 and cold winters completed the distress of the tenants. Some relief has been afforded to them since by the government remitting part of the arrears, and granting delay for the rest. There are 2500 enfiteuti or perpetual tenants in the Tavoliere; the annual charge on the pasture-land is 346,000 ducats; that on land in cultivation is about 600,000. The monti frumentarii, which exist here as in other parts of Italy [BRESCIA], and which lend corn for seed or consumption to poor cultivators at a small interest, have increased. The breed of sheep has been improved by the cross of merinos, and the wool, which was once very coarse, is now doubled in value, being 80 ducats the cantaro (about 200 lbs. English). In 1884 the quantity of wool produced was about 80,000 rubbi. The breed of horses has also been improved; and winnowing and threshing machines have been introduced. Notwithstanding the dryness of the soil and the little manure used by the cultivators, wheat thrives very well on it. Capitanata exported, in 1833, through the ports of Manfredonia and Barletta, 269,907 cantara of wheat, 5094 of barley, 6159 oats, 1568 Indian corn, 6281 beans, and about 200 of peas. From the Gargano, which is the best cultivated district in the province, oil, lemons, oranges, carobs, capers, and terebinth gum are exported to the annual value of 78,000 ducats a year. Large eels from the lakes of Varano and Lesina, in the same district, are exported chiefly to Naples, to the amount of 16,000 ducats. Cheese, cattle, and ponies form the other articles of exportation. The manufactures are very few, consisting of some linens made at Cerignola, coarse hats, leather, common soap, &c. Capitanata owns only 24 vessels, 12 of which are merely coasting boats. Manfredonia is the only harbour in the province, but there is not depth of water for large vessels. The town is well built, has a castle, several churches, an archbishop's see, and 5000 inhabitants. Near Manfredonia are salt-works of marine salt. The Sipontine marshes in the neighbourhood, which affected the health of the town, have been lately drained. The Candelaro, Celone, and other rivers, have been embanked to prevent fresh inundations. A canal was cut in 1830 for the waters of the Candelaro to the sea. By these means several thousand moggia of ground have been recovered. The marsh called Lago Salso, between the Candelaro and the Cervaro, is about four miles in length and two in breadth. Further E. along the coast, and between the mouth of the Carapelle and that of the Ofanto, is the great marsh called Lago Salpi, 20 square miles in extent and only 2 feet in its greatest depth; it is nearly dry in summer, and poisons the air all around. Several projects have been formed for drying it up, but none have yet been carried into execution. Two miserable villages, Salpi and Casal Trinità, are near its borders.

Foggia, the capital of Capitanata, is a well built modern town of 21,000 inhabitants, the seat of the provincial courts of justice, of a commercial court, and the centre of all the trade of the province. Around Foggia are plantations of olives, vines, and other fruit trees, which form an oasis in the midst of a desert. Many of the provincial nobility and gentry reside at Foggia. The great road from Naples to Barletta, Bari, &c., passes through Foggia, whence other roads branch off to Manfredonia and Mount Gargano, to San Severo, and to Lucera. Foggia is 78 miles E.N.E. of Naples, and 20 S.W. of Manfredonia. Lucera, 10 miles W. of Foggia, is built on a hill, with an old castle of the time of Frederick of Suabia, a fine old cathedral, a royal college or gymnasium, a bishop's see, and a population of 8000. San Severo, at the foot of Mount Gargano, 18 miles N.W. of Foggia, is a bishop's see, and has 10,000 inhabitants. Monte Sant' Angelo, built on Mount Gargano, 9 miles N.E. of Manfredonia, is in a romantic situation, and contains the cave and sanctuary of St. Michael. At the back of Mount Gargano is the small town of Viesti, on the Adriatic coast. In the south part of the province are Bovino, with 3000 inhabitants, Troja, and Ascoli already mentioned. (Afan di Rivera, *Considerazioni sulle due Sicilie*; *Lettera da San Severo*, in No. 18 of the *Progresso*, a Neapolitan journal, which gives a good statistical sketch of the province.)

CAPITOL, CAPITO'LIUM, MONS CAPITOLI'NUS, a hill, a fortress, and a temple, celebrated in the history of antient Rome. The temple and the fortress no longer exist; and the hill is called by corruption Campidoglio. It rises on the eastern skirts of the inhabited part of modern Rome, which it divides from the Forum and the other forsaken districts of the antient city. The Capitoline Mount is of an oval shape, and about one mile in circumference at its base; it is divided from the Quirinal to the N E. by a narrow valley, in which the Forum of Trajan once was, and the pillar still is; it has to the E. the Forum of Augustus and the Via Sacra, which divides it from the Esquiline hill; to the S.E. the valley of the Forum Romanum, which divides it from the Palatine hill; to the S. the Forum Boarium, which divides it from the Aventine hill; and the Tiber to the S.W. It has two summits, one to the N. towards the Quirinal, on which the church and Franciscan convent of Ara Cœli now stand; and another to the S. towards the Tiber, on which are the palace and garden of Caffarelli. At the S. end was the Tarpeian rock, down which state-criminals were hurled. The height of this side of the hill is very much reduced, the ground at the foot of it having been considerably raised by ruins and rubbish, and the rock itself having been sloped down, and houses built against it. Still it rises abruptly in one place, to the elevation of 80 palmi (65 feet), at the back of the Caffarelli gardens, above Piazza Montanara. The height of the Capitol, taken at the pavement of the church of Ara Cœli, which is the highest summit, is 155 feet above the sea, 135 above the Tiber taken at its medium height, and about 90 feet above the present surface of the Forum, which however is in several places 20 feet higher than its antient level.

This hill is said to have been called Saturnius in the ante-Roman times. When the first Romans built their town on the Palatine, they chose the opposite hill, which was then more abrupt, to build their arx or citadel upon. In their first war with the Sabines, according to the old story, the latter took possession of this strong hold by the treachery of a woman called Tarpeia, the daughter of the Roman commander. Hence the hill took the name of Tarpeius. After the peace Tatius and his Sabines settled on the Tarpeian Mount, and Romulus remained on the Palatine. Tarquinius the Elder began to build a temple to Jupiter on the Tarpeian Mount, the summit of which he levelled for the purpose. The building was afterwards continued by Tarquinius Superbus, who engaged workmen from Etruria for the purpose, and employed in it the money resulting from the plunder of Suessa Pometia, a city of the Volsci, which he had taken and destroyed. Wishing the place to be wholly consecrated to Jupiter, he ordered the chapels and votive altars erected by Tatius and others to be removed. The augurs consulted the flight of birds to ascertain the will of the gods, and all were declared to have assented except the god Terminus, who would not stir from his place. This was considered as an omen of the perpetuity of the new edifice and of the city. In digging some part of the foundations, the workmen were said to have found a human head quite fresh, which was interpreted to signify that the spot would be the head and centre of the Roman power. (Livy, i. 55.) The temple was accordingly dedicated to Jupiter Capitolinus, from caput, 'a head.' It has been a subject of dispute whether this temple stood on the N. or S. summit of the hill; it seems probable, however, that it stood on the N. side, where the church of Ara Cœli now stands. (Nardini, Ficoroni, &c.) It is said to have stood *in arce*, 'in the citadel,' which was originally on the S. summit; but as the entire mount was afterwards inclosed by walls and fortified, the word arx was used indiscriminately for the whole. The temple is said to have had its front to the S. towards the Aventine; had it been at the S. extremity, there would have been no access to it, except at the back, by the Clivus Capitolinus. This is one of the arguments used by Nardini and others. The temple of Jupiter Capitolinus was burnt in the civil war of Marius, but Sulla rebuilt it with much greater splendour and of the most costly materials. It is said to have been 200 feet long and 185 wide; it had a peristyle with three rows of marble columns in front, and two rows of pillars divided the interior into three aisles, at the furthest end of which were three cellæ dedicated to Jupiter, Juno, and Minerva. The vault of the temple and the external roof were covered with plates of gold. This temple was the principal sanctuary of Rome, to which the victorious generals and emperors went in triumphal procession to sacrifice to the gods. Other temples were raised successively on the Capitoline hill, such as that of Juno Moneta, with the mint annexed to it; of Jupiter Feretrius, said to have been built by Romulus; of Mars, of Venus, of Fortune, and of Isis and Serapis. The temple of Concord stood on the slope towards the Forum. A Bibliotheca or Library, the Tabularium, Athenæum, Curia Kalabra, the Atrium publicum, and other public buildings, were also on the Capitol. In the intermontium or little valley between the two summits, stood the Asylum or place of refuge, between two plantations of oak trees. It is difficult now to form an idea of the appearance of the place and the effect it must have produced. It is evident that the sides of the hill were much more abrupt and stood higher above the plain below than at present. The only access was from the Forum on the S. side by the Clivus Capitolinus and the Clivus juxta Asylum. There were also 100 steps to ascend to the Tarpeian rock, being probably an opening on that side branching out of one of the two Clivi.

The principal buildings of the modern Capitol consist of three palaces, the work of Michel Angelo, forming three sides of a square, in the middle of which stands the equestrian statue of Marcus Aurelius. The open side is to the N.W. towards the modern city. The palace facing it is that of the senator of Rome; to the left of it is the palace de' Conservatori; and to the right that of the Capitoline

Museum, one of the finest collection of statues and sculptures in Italy. The three palaces and the square between occupy the intermontium, the two summits being occupied by the church of Ara Coeli and the palace and gardens of Caffarelli. Two ways lead down by the senatorial palace into the Campo Vaccino, or antient Forum.

CAPITULA'RIUM, literally 'a book divided into chapters,' was the name given to the laws issued by the French kings of the first and second races, in the great assemblies of the nobles and bishops which formed the states of the kingdom, for the administration of civil and ecclesiastical affairs. These laws, being classed under heads or chapters, were called capitularies. Childebert, Clotarius, and Dagobert, and afterwards Charlemagne, Louis le Débonnaire, Charles the Bald, &c., issued capitularies. Those of Charlemagne are the most celebrated, being more extensive, more enlightened considering the age he lived in, and forming a real code of legislation which remained in force long after. Ansegisus, abbot of Fontenelles, made a collection in books of the capitularies of Charlemagne and his son Louis le Debonnaire in the year 827. Other collections were published subsequently. After Charles the Simple, A.D. 92[illegible], no more capitularies were issued, and no laws or statutes are known to exist of the subsequent period till the time of Louis le Gros, A.D. 1100. Louis le Gros began to issue charters to the communes or churches, but no general laws or ordinances appear to have been enacted, except one by Philippe Auguste in 1190, till the time of St Louis, A.D. 12[illegible]0, who began to make regular ordinances. Baluze published a complete collection of all the capitularies issued by the kings of the first and second race, with notes—*Capitularia Regum Francorum*, 2 vols. folio, Paris, 1677.

CAPITULATION, a series of articles expressing the conditions under which a fortress is surrendered to an enemy.

The agreement by which an army or a large division of troops surrenders to a superior force, or engages to evacuate the territory which it occupies, when its strength and condition are yet such as to make itself respected by the enemy, is called a Convention. Such was that made at Cintra, or rather at Lisbon, between the generals of the French and English armies on the departure of the former from Portugal in 1808.

When the provisions and ammunition of a garrison are nearly expended, when breaches have been made in the ramparts of the fortress, and no chance remains of being succoured, the governor of the place is justified in entering into an agreement with the besiegers, respecting the terms by which he consents to deliver his charge into their hands; and by the rules of war, as well as from the regard due to a gallant adversary, he is entitled to obtain an honourable capitulation. It may be observed that if the governor should postpone the proposals to surrender till his provisions are entirely exhausted, the besiegers may refuse to grant terms to the garrison, which must then surrender at discretion.

When the reign of Napoleon was drawing to an end, and he [illegible] himself reduced to the necessity of acting on the defensive, the duty of defending the fortresses of France was impressed on the commanders by every motive which the love of glory and the fear of disgrace can inspire. In the imperial decree concerning them it is stated that every commander who shall appear to have defended his fortress like a man of honour and a faithful subject, shall, together with the officers and soldiers who may have distinguished themselves in the defence, be presented on a day of general parade, and receive, in presence of the troops, public testimonials of the emperor's satisfaction; that no time shall be lost in exchanging those who may be made prisoners of war; and that every commander who shall be killed on the breach, or die of his wounds, shall be buried with the same ceremonies as a Grand Cross of the Legion of Honour. On the other hand it is stated, that every capitulation made without a vigorous resistance continued to the last moment, and without having sustained at least one assault on the rampart of the place, is criminal and dishonourable; the commander who so surrenders is made responsible for all the consequences of his cowardice or treachery; he is threatened with all the severity of the law; and the decree consigns to infamy, and punishes with death, him who yields to the menaces or proposals of the enemy.

If the resolution to surrender should be at length taken, the conditions [illegible] by [illegible] be expressed concisely in [illegible] articles, and should be such only as he [illegible] expect to obtain consistently with the circumstances of the case. The governor should however firmly insist upon their execution when granted. He is not to separate himself from his garrison, but he must share its fate as well after as during the siege; and he is to stipulate in favour of the sick and wounded for as many advantages as he can possibly gain.

It has happened that the governor of a fortress has been induced to leave his post by an invitation to a personal conference with the general of the besieging army, and that advantage has been taken of his absence to assault the place in the hope of gaining it during the confusion then expected to prevail there. History moreover records instances in which the besieging troops have entered the place and committed disorders even while the commanders have been occupied on the breach in drawing up the articles of the capitulation. To avoid such misfortunes the governor of a fortress should on no account go out for the purpose of treating with the enemy, but he must employ in that duty officers on whose zeal and firmness he can rely.

By the terms of a capitulation the arms and military stores in the place are generally given up to the besiegers, the officers and troops of the garrison retaining only their private property, and being allowed to march out with the honours of war, that is, with drums beating, colours flying, &c. When necessary a convoy is allowed them for protection till they arrive at the place of their destination.

CAPITULUM, a head of flowers, a particular form of inflorescence. Theoretically botanists consider it an undeveloped spike, the axis of which becomes a receptacle, and the external empty bracts an involucre. The dandelion, and all Compositæ, have an inflorescence of this nature; it is vulgarly looked upon as a flower.

CAPO D'ISTRIA, a sea-port town of Istria, on the Adriatic Sea. It stands on an egg-shaped island, which is connected with the main land by a long causeway. The town is about two miles in circumference; it has some trade, and is considered much healthier than most of the places on that coast. The export trade is chiefly supplied by the salt pans in the neighbourhood, and by the vineyards, which afford a quantity of good wine.

CAPO D'ISTRIA, the Count of, born at Corfu in 17[illegible], was the son of a physician, and he himself began to study medicine at Venice, to which republic Corfu and the other Ionian islands then belonged. His father was chief of the provisional government of the Ionian islands in 1799, when the Russians took possession of them. In 1806, when the Seven Islands, by the treaty of Tilsit, were placed under the protection of Bonaparte, both Capo d'Istria and his father left Corfu and entered the service of Russia. The count's first post was an humble one, but as he showed a talent for diplomacy, he was speedily advanced and attached to the Russian embassy at Vienna. In 1812, during Bonaparte's expedition to Moscow, Capo d'Istria was charged with certain diplomatic operations connected with the army of the Danube, or, as it is more commonly called, the army of Moldavia, under the command of Admiral Tchitchagof, which had been engaged against the Turks and then occupied the two principalities of Wallachia and Moldavia. When (in the summer of 1812) peace was concluded between Turkey and Russia, and the latter power was enabled to recall the army of Tchitchagof from the Danube to the Berezina, Capo d'Istria went with it, and after the finishing blow given to the French at the passage of the Berezina, he remained at the head quarters of the Emperor Alexander of Russia, who formed a high opinion of his abilities and address. In 1813 he was sent by Alexander as his minister plenipotentiary to Switzerland, and, before the allied armies crossed the Rhine into that country, he drew up a declaration promising the re-establishment of Helvetian independence and the restitution of all the territory that the French had taken from the Swiss. These promises were well kept, and the Count so conducted himself as to merit the esteem of the Swiss. The Constitutional Act, which he sanctioned and forwarded, removed many old abuses and invidious distinctions. In September, 1814, Capo d'Istria left Switzerland for the Congress of Vienna, where, mainly through him, the affairs of the Swiss were happily terminated. In 1815 he was with the Emperor Alexander at Paris, and was his plenipotentiary in the definitive treaty of with France. In the course of this year he advocated the cause of education, and wrote the emperor an account of the establishment of M. Fellenberg at Hofwyl. This letter, in the form of a pamphlet, was published at Paris in 1816, in the course of which year the Grand Council of Lausanne gave the count the citizenship of the Canton of Vaud. A short time afterwards he was recalled to St. Petersburg by the Emperor Alexander, who appointed him one of his secretaries of state for foreign affairs, the duties of which office he divided for some time with Count Nesselrode. Capo d'Istria had a principal share in the diplomatic underminings of the Turkish empire which took place from 1815 to 1827, when Russia entered into Mr. Canning's treaty of alliance, (in which, with England and France, she was to preserve Greece from destruction,) rather with the view of injuring and weakening Turkey than from any affection for the Greeks. Notwithstanding these circumstances, however, Capo d'Istria was allowed to take upon himself the office of president of the Greek government, in which he was regularly installed early in the year 1828, or a few months after the battle of Navarino.

We cannot go into the long question of his almost constant dissensions with the people whom he was sent to govern. There were evidently faults on both sides—on both sides violence, obstinacy, duplicity, and intrigue; but making many allowances for the Greeks, the opinion of most of those who watched his administration in the country was very unfavourable to the Count, who was not merely suspected of a desire to make himself king or perpetual and despotic president of the Greeks, but also to render Greece wholly subservient to Russia. Some memorable letters which he wrote to Prince Leopold of Saxe Cobourg (now king of the Belgians), to whom the Greek crown had been offered in 1829, mainly induced that prince to decline accepting it, which he did definitively on the 21st of May, 1830. On the 9th of October of the following year, Capo d'Istria was assassinated at Napoli di Romania, on the threshold of a church, by George, the son, and Constantine, the brother, of Pietro Mauromichali, the old bey of Maina, whom he had detained for many months in prison without trial or even a specific accusation. Some circumstances connected with this event, and with the general conduct of Capo d'Istria, are given by Thiersch in his *Etat Actuel de la Grèce*, Leipzig, 1833.

CAPONNIERE, in fortification, is a passage protected on the right and left by a wall or parapet. The term is generally applied to that by which the communications are made across the main ditch of a fortress to the outworks [**Bastion**, G *fig.* 1], or from the covered-way to the gorge of an advanced work. When a passage exposed on one side only is thus protected it has the name of a demi-caponniere.

The protecting parapet is generally of earth, with its upper surface descending gradually to the bottom of the ditch, in order that the enemy may be completely exposed in advancing up to it, and also that the ditch may be defended by a grazing fire from thence. A passage of this kind is however exposed to the plunging fire of the enemy from the crowning battery H, and from that which should correspond to it on the left hand of the front of fortification; it may therefore be further protected by a parados or elevation of earth extending along its centre; for by this the defenders behind both parapets would be effectually concealed.

Sometimes the caponniere is a vaulted gallery of brickwork, the sides of which are pierced with loop-holes or narrow openings, for the defence of the ditch by a fire of musketry. In this case a trench is cut on the exterior, and parallel to each side of the work, in order to prevent the enemy from approaching near enough to annoy the defenders within.

Palisade caponnieres are formed across the ditches of field-redoubts when those ditches are incapable of being defended from the parapets. If covered with a roof for protection against shells or grenades, that roof should be kept below the natural ground, in order that it may be concealed from the view of the enemy at a distance.

CAPPADOCIA, a country of Asia Minor, usually spoken of in two divisions—1. Cappadocia the Great, or Cappadocia bordering on the Taurus (Strabo), also called Cappadocia simply, and 2. Cappadocia bordering on the Pontus, often called Pontus simply. Cappadocia on the Pontus includes the country N. of the range of mountains anciently called the Paryadres. Taken in its widest sense, Cappadocia included nearly the whole of the Turkish province of Roum, and a great part of Karamania. It was bounded on the N. by the Pontus Euxinus (Black Sea), on the S. by Taurus, which divided it from Cilicia, on the W. by Paphlagonia, Phrygia, and Galatia, and on the E. by the Euphrates. Both the Cappadocians (Καππαδόκαι) on the Pontus and those bordering on the Taurus were called Syrians (Σύροι) by the Greeks, and White Syrians (Λευκοὶ Σύροι), to distinguish them from the Black Syrians beyond the Taurus. (Herod. i. 72, v. 49; Strabo, xvi. p. 737, *a*, Casaub.) Cappadocians was the name given them by the Persians. (Herod. vii. 72.) There is a river Cappadox, mentioned by Pliny, rising in some of the mountain-ridges, and flowing along the boundary of Galatia and Cappadocia into the Halys: the name is not mentioned by Strabo; and it is probably of comparatively late origin. Some writers however have derived the name of the country from the river.

Our information on this important country has not been much increased by modern travellers: we are still indebted chiefly to Strabo, who however, considering that Amasia on the Iris (Yeshil-Ermak) was his birth-place (Strab. xii. p. 561, *b*.) has not told us more than we might have expected. Cappadocia is one of the richest parts of Asia Minor; it is characterised by extensive plains of great fertility. Of the mountains the principal is the Taurus, which forms in fact the southern boundary. Two other important chains, the Anti-Taurus and the Paryadres (Keldir), run nearly parallel from Armenia into the centre of Cappadocia, where they form the high ridges of Mount Argæus (Argis-Dagh). From the summit of Mount Argæus Strabo says (xii. p. 538), that the few who had ever gone so high had been able to see the Black Sea and the Gulf of Scanderoon, an assertion which is confuted by the bare inspection of a map. Argæus is said to be covered with perpetual snow. Cappadocia the Great generally has little wood; almost the only timber district is in the neighbourhood of Mount Argæus which supplies the rest of the country with fuel. Beyond this woody region which surrounds the mountain is a sandy plain with a substratum of rock, quite barren and uncultivated. The part between Mount Argæus and Mazaca (Kesarieh), and indeed most of this district, appears to have been the seat of volcanic action (Strab. xii. p. 538): it abounds in water, chiefly marshes caused by the overflow of the river Melas. On the banks of the Melas were some large stone quarries, which supplied the people of Mazaca with building materials, but which appear to have been sometimes rendered nearly useless by the badness of the air, owing to the exhalations from the river. Mazaca was the favourite abode of the kings of Cappadocia, who appear to have selected it for its central position, and because it abounded in timber and in stone as well as in fodder, which was a great object where so much attention was paid to cattle. (Comp. Xen. *Cyrop.* ii. 1. 5.) The tribute which they paid to the Persian monarch consisted chiefly in horses, mules, and sheep. The high table-lands of this country are admirable pasture land; and it is probable that in very early, as well as in later times, the Cappadocians carried on an extensive trade in supplying the neighbouring nations with horses and mules. (Ezekiel xxvii. 4.)

The principal towns of Pontic Cappadocia were on the coast. A little E. of the mouth of the Halys was Amisus (Samsun:) farther E. on the river Thermodon stood Themiscyra, whose plains were the fabled abode of the Amazons: proceeding along the coast we come to Cerasus (Κερασουντ-ος), the modern Kharesoun, where cherry-trees grow wild in great abundance on the hills (Tournefort, *Relat. d'un Voyage au Levant*, ii. p. 221): it was from this place that Lucullus first brought cherries into Italy on his return from the Mithridatic war. The word 'cherry' (*cerasus*) is said to be derived from the name of the place. Just upon the eastern boundary of Cappadocia on the Pontus stands Trapezus (Τραπεζουντ-ος), the modern Trebizond, originally a Greek city, a colony from Sinope (Xen. *Anab.* iv. 8. 22), where the Greeks met with an hospitable reception on their retreat after the battle of Cunaxa. Trapezus and Cerasus paid tribute to Sinope. (Xen. *Anab.* v. 5. 10.)

The chief towns inland were Amasia, Mazaca, Comana (in Pontus), the great emporium for the Armenian merchants (Strab. xii. p. 559), and Comana in Cappadocia the Great, the modern Bostan, which contained a great temple of Bellona. To the W. of Comana, near the boundary of Lycaonia, was Tyana, or as Xenophon (*Anab.* i. 2. 20.) calls it, Dana, the limit of Cyrus's march in Cappadocia. The principal rivers of Cappadocia are the Halys (Kizil-Ermak) and the Iris (Yeshil-Ermak), both of which flow into the Euxine; and the Melas, which flows into the Euphrates. The Kizil-Ermak flows through a country abounding in salt-hills, and hence Strabo supposes the antient name to have been derived (xii. p. 546, *d.*). Indeed in many parts of Cappadocia salt tracts are found of great extent. The Halys rises further to the E. than is represented in the ordinary maps, and runs for about half its course from W. to E. in a longitudinal valley. It then turns to the N. and cuts through the mountain-ranges, all of which have a general direction parallel to that of the Euxine coast. [ANATOLIA.] The Iris flows through Amasia.

Cappadocia abounded also in mines of iron and silver: Horace alludes to this fact. (*Epist*, i. 6. 39.) The iron mines in the N.E. of Pontus were worked by the Chalybes (*Chaldæi*, Strab. xii. 549, *d.*; see Xen. *Anab.* v. 5. 1), the greater part of whom appear to have gained a livelihood by working in iron. On the same coast E. of Samsun (Amisus) at a place called Unieh, rock alum still forms a considerable article of trade. There is said to be a silver mine at a place near Amasia, called now Hadji Kioi. Crystal, jasper, and onyx are said also to enrich this country. (Strab. p. 540, *a.*) Strabo speaks of a beautiful stone which was produced in Cappadocia, white like ivory; the handles of swords were made of it.

The Cappadocians were very generally known during the Roman occupation of their country for their unprincipled and vicious character; so much so that the word 'Cappadocian' was only another name for a villain.

The condition of Cappadocia before the period of the Persian rule is uncertain; possibly it belonged to the extensive kingdom of Lydia. At any rate both Cappadocia on the Pontus and Cappadocia on the Taurus appear to have formed one state. Darius Hystaspis is said to have first divided it into two satrapies. (Strab. xii. 534, *c.*) The satraps appear to have been kings of the countries tributary to the Persian monarch, and hence an hereditary succession is observed. The circumstance that Darius and his successors in this, as in most other cases, left the government of the district with the native princes, is probably to be attributed more to their inability to prevent it than to any other reason.

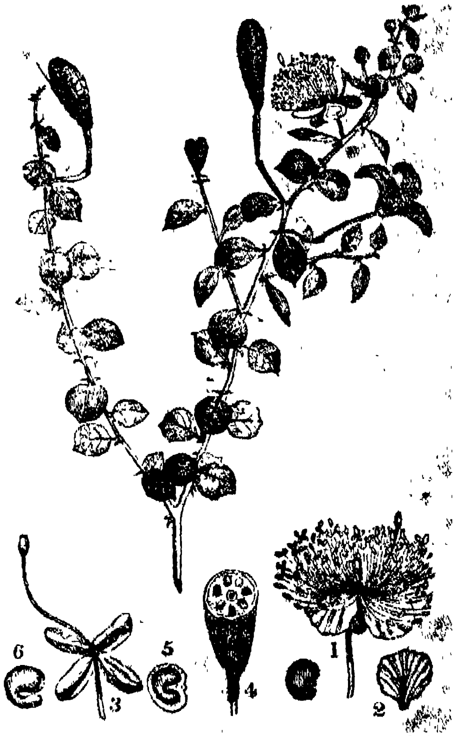
The first king of Cappadocia, according to Strabo (xii. p. 534, *a*), was Ariarathes. But Aribæus, mentioned by Xenophon (*Cyrop.* ii. 1, 5), would appear to have preceded him. The following list has been drawn up in the *Universal History* (vol. x. p. 8)—Pharnaces, Smerdis, Atamnas, Anaphas, Anaphas II., Datames, Ariaramnes, Ariarathes I., Olophernes, Ariarathes II., Ariarathes III., Ariaramnes II., Ariarathes IV., Ariarathes V., Ariarathes VI., Ariarathes VII., Ariarathes VIII., Ariarathes IX. (the family of Pharnaces now extinct), Ariobarzanes I., Ariobarzanes II., Ariobarzanes III., Archelaus. On the death of Archelaus Cappadocia was reduced to a Roman province (Strabo, xii. p. 534), which it continued till it was invaded by the Turks.

On the division of Cappadocia by the Persians Pontus was given over to one of the ancestors of Mithridates, according to Justin and other writers. The following is a list of the kings as they have been mentioned in history:—Artabazes (an interval of perhaps 80 years then occurs), Rhodobates, Mithridates I., Ariobarzanes, Mithridates II., Mithridates III., Ariobarzanes II., Mithridates IV., Mithridates V., Pharnaces I., Mithridates VI., Mithridates VII., surnamed the Great, with whom the Romans waged the celebrated Mithridaticum Bellum (he died B.C. 64); Pharnaces II., Darius, Polemon I., Polemon II. Pontus was then reduced entirely to a Roman province (Tacit. *Hist.*, iii. 47), which it continued till the time of Alexius Comnenus, in whose family the empire remained till Mohammed II. reduced it to slavery.

[British Museum. Actual size. Silver. 61 grains.]

CAPPARIDACEÆ, a natural order of dicotyledonous polypetalous plants, having a superior fruit, parietal placentæ, an embryo curved upon itself without albumen, four petals and sepals, a great number of stamens, and an ovary elevated upon a long stalk. They are known from Cruciferæ by their indefinite stamens and reniform seeds. All of them appear to be more or less acrid. They are bushes or herbs found all over the tropics, and not extending in many places beyond them. Egypt and the south of Europe, which are inhabited by Capparis spinosa and similar species, offer the greatest exceptions to the rule.

Some of the American species of Capparidaceæ are very poisonous; others act as vesicatories; and a few are merely stimulant. To the latter class belongs the *Capparis spinosa* of the south of Europe. This plant grows naturally upon rocks and ruins all over the south of France and Italy, rendering them inconceivably gay with its large white blossoms, from the centre of each of which there springs a long tassel of deep lilac stamens. The flower-buds constitute the capers of the shops, the quality of which depends exclusively upon the age at which they are gathered, the smallest and youngest being the dearest and most delicate, and the largest and oldest the coarsest and cheapest. On an average each plant of the Caper bush gives a pound of buds. The consumption of capers in this country is inconsiderable, not amounting to more than about 60,000 lbs. a-year.



[Capparis spinosa.]

1, an expanded flower; 2, a petal; 3, a calyx with the stalked ovary; 4, a horizontal section of the fruit; 5, a longitudinal section of the seed; 6, an embryo extracted from the seed-coat.

CAPRA. [GOAT]

CAPRELLA. [LÆMODIPODA.]

CAPRE'OLUS, an old name for the tendril of a vine.

CAPRI, the Roman Capreæ, a rocky but beautiful island in the Mediterranean, situated under the same meridian as the city of Naples, which it immediately faces. It stands at the southern entrance of the Neapolitan gulf; it is two miles and a half from Cape Campanella, which terminates the promontory of Sorrento; about ten miles from Cape Miseno, on the other side of the bay, and rather more than twenty from the city of Naples. It is composed of hard calcareous rocks, which are disposed in two masses with a considerable hollow between them. The highest of these two masses, which is to the W., rises between 1600 and 1700 feet above the sea. It is called Anacapri, and a pretty little town upon it bears the same name. The inhabitants of Anacapri communicate with the other town and all the east of the island by means of a steep flight of 538 steps, which is carried down the face of a precipice in a very curious manner.

The other town, which is called Capri, or "The Metropolis," stands much lower, on a shelving rock towards the eastern extremity of the island: it contains from 200 to 300 small but neat houses, five or six churches and chapels, and a confined piazza or square in the middle. In 1826 the population of the island, including the two towns and the villas, or very small villages scattered here and there on the face of the rock, but almost entirely on the eastern part, amounted to about 3000 souls; a considerable portion of this number being sailors, boat-men, shipwrights, &c., were absent a good part of the year. There were two or three schools established by government. By great industry the islanders have retained and secured patches of good soil on steep hill sides and in the midst of rocks and cliffs: the cultivable parts produce most kinds of vegetables and fruits, a small quantity of excellent oil, and a considerable quantity of a light but generous wine. This wine, which is much used at Naples, is of two sorts, Capri rosso and Capri bianco, or red and white Capri. Another important item of exports consists of quails, which are annually captured at their seasons of passage in vast numbers. In former times the revenue of the bishop of Capri was almost entirely derived from the quail trade: this see is now united to the bishoprick of Sorrento.

The whole circuit of the island does not exceed nine miles; but this narrow space is wonderfully crowded with a variety of scenic beauty, remains of antiquity, and historical recollections. Extensive ruins of the villa of Tiberius, who resided a long time at Capreæ, are still shown, near a bold perpendicular cliff at the eastern end of the island.

CAPRIC ACID, a peculiar acid occurring with the butyric and caproic acids in the milk of the cow and the goat: its name is derived from *capra*, goat. In order to procure capric acid, caprate of barytes is first obtained, and by a tedious process; 100 parts of it are then reduced to powder, and treated with 47·5 of sulphuric acid, mixed with its weight of water. The capric acid is thus separated after long digestion, and it is then to be distilled from chloride of calcium.

Capric acid crystallizes in small needles, which liquefy at about 65° Fahr.; its specific gravity at this temperature is 0·910; it distils without alteration at a temperature above 212°. Water at 68° dissolves only about $\frac{1}{1000}$ of its weight; but alcohol dissolves it in all proportions. Its smell resembles that of the goat.

The saline compounds of capric acid are called *caprates*; no one of them is applied to any use.

According to M. Chevreul, who discovered it, capric acid consists of—

39	Equivalents of carbon	1357·9	or 74·11	
29	„ hydrogen	181·2	9·71	100
3	„ oxygen	300·	16·15	
1	anhydrous acid	1839·1	94·21	
2	water	112·5	5·79	
1	hydrated acid	1951·6	100	

CAPRICORN, TROPIC OF. [Tropics.]

CAPRICORNUS, the tenth constellation in the zodiac, as a constellation, but the part of the moveable ecliptic between 270° and 300° of longitude was also so designated. [Ecliptic.] This constellation never rises in our latitude to a greater altitude than 25°, or thereabouts (we speak of the largest stars, α and β, in the horn). Around it, in the visible portion of the heaven, are Aquarius, Equuleus, Delphinus, Aquila, and Sagittarius. The brightest stars, α and β, are on the meridian at midnight towards the end of July. A line drawn through the bright stars in Lyra and Aquila will, when lengthened, not pass far from the two brightest stars in Capricornus, α and β.

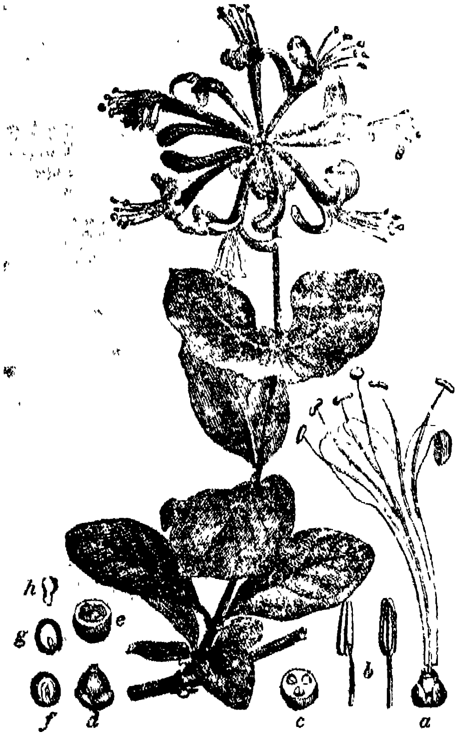
The upper half of Capricornus is that of a goat, and the lower half that of a fish. In some of the Eastern zodiacs it is [illegible] alligator or sea monster. According to Hyginus, [illegible] this constellation in the heavens in [illegible] of Pan, who, when the gods were [illegible] giants in the form of various [illegible] half fish, and lived [illegible]

The following are the principal stars

Character. Those not in Bayer ( )	No. in Catalogue of: Flamsteed, Piazzi ( ), La Caille, C, Zach, Z	No. in Catalogue of: Astron. Society	Magnitude	Character. Those not in Bayer ( )	No. in Catalogue of: Flamsteed, Piazzi ( ), La Caille, C, Zach, Z	No. in Catalogue of: Astron. Society	Magnitude
ξ^1	1	2373	6	κ	43	2570	5
ξ^2	2	2375	6	(d^2)	44	2575	6
	3	2382	6	(d^3)	45	2576	6
	4	2384	6	c^1	46	2579	6
α^1	5	2386	4	c^2	47	2584	6
α^2	6	2388	3	λ	48	2585	5
σ	7	2393	6	δ	49	2586	3
ν	8	2396	6		50	....	6
β	9	2397	3	μ	51	2600	5
π	10	2403	5	β^1	(79)	2395	7
ρ	11	2404	6		(87)	2530	6
o^2	12	2408	6		(93)	2532	7
τ^1	13	2424	6		(145)	2405	6½
τ^2	14	2430	6		(145)	2547	7
υ	15	2432	6	(f)	(146)	2406	6
ψ	16	2445	5		(148)	2548	7
	17	2446	6	o^1	(153)	2407	7
ω	18	2464	6		(161)	2552	6
	19	2474	6½		(170)	2412	6
	20	2481	6½	(n)	(174)	2413	6
	21	2490	6		(177)	2554	6½
η	22	2497	5		(184)	2557	7
θ	23	2501	5		(187)	2414	7
A	24	2504	6		(194)	2418	7
χ	25	2506	6		(240)	2437	6½
	26	..	6		(243)	2573	6
(χ^3)	27	2507	6		(296)	2448	7
φ	28	2514	6		(298)	2449	6
(s)	29	2516	6		(305)	2453	6
(r)	30	2520	6		(310)	2457	6
	31	2521	7		(322)	2462	6
ι	32	2528	5	(p)	(325)	2461	6½
	33	2537	6	(m)	(339)	2468	6
ζ	34	2543	5		(370)	2475	7
	35	2545	6		(386)	2482	7
b	36	2546	6		(404)	2367	7
(t^1)	37	2555	6		(406)	2368	7
(t^2)	38	2556	7	(n)	(411)	2492	6
ε	39	2560	4		(454)	2502	7
γ	40	2566	4		1692 C	2460	6
	41	2569	6		1370 Z	2441	7
d^1	42	2568	6				

CAPRIFICATION, the process by which the maturation of the fig is accelerated in the Levant. It is well known that fruits which have been bitten by insects ripen sooner than others, the wound appearing to act as a stimulant to the local action of the parenchyma. This is turned to account by the Greeks in the following manner, which is called Caprification. When the cultivated fig is preparing for becoming ripe, a quantity of the branches of wild fig trees are brought into the fig orchards and placed upon the cultivated plants. The wild figs bring with them a great number of a small insect called *Cynips Psenes*, or *Diplolepis Ficus Caricæ*, which fly among the cultivated figs and pierce their fruit for the purpose of laying eggs. This not only brings about an earlier ripening of the fig crop than would otherwise be obtained, but enables the cultivator to obtain two harvests a year. It is, however, said that the practice deteriorates the quality of the fruit. Caprification has been artificially imitated by puncturing a fig with an awl, and introducing a little oil into the wound, for the purpose of preventing its healing too soon. (De Candolle, *Physiol. Végétale*, p. 580; and Treviranus in the *Linnæa for* 1828, p. 70, tab. 1, fig. 1 and 2, in which last place the insect is figured.) This kind of caprification must not be confounded with another sort, of very high antiquity, that is practised with the date palm, and which has been mentioned by Herodotus (i. 193). In this latter case the clusters of male flowers from wild date trees are brought and shaken over the clusters of cultivated females, which are thus fertilized and enabled to ripen. It is obvious that the two cases are different, although under one common term. In the fig the *Cynips*, brought by the wild branches, punctures the cultivated figs and accelerates their ripening: in the palm the pollen of the wild males is shed upon the stigmas of the cultivated females, and fecundates them.

CAPRIFOLIA'CEÆ, a natural order of Monopetalous Dicotyledons, having an inferior ovary, opposite leaves without stipules, and a small embryo lying in a considerable mass of horny albumen. The type of the order is the genus *Caprifolium*, or honeysuckle; the genera that are associated with it in part consist of dismemberments of *Lonicera*, and in part of plants having a resemblance to them in habit. The genera most dissimilar to *Caprifolium* are *Sambucus* and *Viburnum*; but their characters are more dependent for their dissimilitude upon the shortness of the tube of their corolla and the manner in which the flowers are arranged, than upon any actual differences of organization. *Caprifoliaceæ* differ from *Cinchonaceæ* in little except the want of stipules between the leaves, and consequently there is great resemblance in their sensible properties; their bark being often astringent, their leaves sometimes emetic, and the seeds of *Triosteum perfoliatum* similar to coffee. (Lindley's *Natural System of Botany*, ed. ii., p. 247.)



[Caprifolium perfoliatum.

a, flower opened to show the insertion of the five stamens; *b*, front and back view of anthers; *c*, horizontal section of ovary; *d*, fruit; *e*, the same in section; *f*, seed; *g*, the same in section, showing the embryo; *h*, embryo.

CAPRIMU'LGIDÆ. [GOAT-SUCKERS.]

CAPROIC ACID is procured from milk, by decomposing the caproate of barytes: upon 100 parts of this salt there are to be poured 29·63 parts of sulphuric acid, diluted with an equal weight of water. The greater part of the caproic acid separates. A further quantity may be obtained by the addition of a fresh quantity of concentrated sulphuric acid, equal in weight to the first. The caproic acid separated is to be digested for forty-eight hours with chloride of calcium, and then distilled.

Caproic acid is a very fluid oil; it is colourless; very inflammable; its taste is acid and penetrating; its smell resembles that of acetic acid and perspiration. Its density at 26° Fahr. 0·622; it does not congeal at 12°, and boils [illegible] 212°. It gradually vaporises when exposed to the [illegible] water at 43° scarcely dissolves 1·04 per cent.; but [illegible] alcohol dissolves it in all proportions. Its salts, which are quite unimportant, are termed *caproates*. M. Chevreul, who discovered this acid, gives the following as its composition :—

24	Equivalents of carbon	917·28 or	68·66	100
19	hydrogen	118·56	8·88	
3	oxygen	300·00	22·46	
1	anhydrous acid	1335·84	92·23	
2	water	112·48	7·77	
1 ,,	hydrated acid	1448·32	100·	

CA'PROMYS. [MURIDÆ.]

CA'PROS, a genus of fishes of the section *Acanthopterygii* and family *Scomberidæ*.

But one species of this genus has yet been discovered; the *Capros aper* of Lacepède, and *Zeus aper* of Linnæus.

The characters of the genus are—body short, somewhat ovate, much compressed, and covered with small serrated scales; mouth capable of considerable protrusion. Dorsal fin emarginated (as in the dories), but no spines at the base, nor at the base of the anal fin.

Capros aper, or the *boar-fish*, in general appearance is not unlike the dory (to which it is in fact closely allied), but, independent of other characters, may be distinguished by its mouth being more attenuated and protractile, the body being covered with scales, and the want of long filaments to the dorsal spines.

This fish appears to be most generally about six inches in length, of a pale carmine colour above, and silvery-white beneath. The colour of the upper part extends more or less down the sides of the body, and sometimes several orange-coloured bands are observable extending from the back downwards. The lateral line is not readily seen, excepting in recent specimens, when it is said to have a crystalline appearance.

This fish is a native of the Mediterranean, and has been found on our own coast, but very rarely; a third specimen has recently been recorded as British.

An interesting account of this fish will be found in Yarrell's 'History of British Fishes.'

CA'PSA. [CONCHA'CEÆ.]

CA'PSICUM or bird-pepper, a genus of solanaceous plants, with the shell of the fruit fleshy and coloured, and containing a pungent principle, which also exists in its seed in great activity. On this account both the fruit and seeds of different species of capsicum are in request as a condiment, and either in the unprepared state, or ground into Cayenne pepper, form a considerable part of the stimulating vegetables used by man. In Europe the capsicum enters largely into the seasoning of food, and the preparation of pickles; and in warmer countries it constitutes one of the first necessaries of life, either green or ripe. The species from which the fresh capsicums used in Europe are principally obtained is the *Capsicum annuum*, a weedy plant found wild in South America and the West Indies. This species grows from one to two feet high, forming a dark green bush with ovate or ovate-lanceolate leaves; its flowers are small and white; its fruit is extremely variable in size, colour, position, and even in quality. Red and yellow are the prevailing colours; the oblong-conical is the ordinary figure; and to hang in a drooping position is the most usual direction of the fruit. But round, ovate, and even depressed fruit is known, and many varieties constantly bear their fruit in an erect position. Most of them are too pungent for European palates; but the large red bullock's heart and yellow tomato capsicums are mild enough to be sliced with salad.

A much hotter species is the *Capsicum fruticosum* or goat-pepper, a native of the East Indies, which differs from the *Capsicum annuum* in being a shrub, and in its fruit being very small. There is also a kind cultivated by the Chinese, with black fruit; and botanists recognise many others, but they appear to be in many cases mere varieties of *C. annuum* or *fruticosum*.

The acrid principle of capsicum has been analysed by Braconnot (*Annales de Chimie*, vol. vi., p. 122), who found it not to be volatile, to dissolve readily in water, more freely in alcohol and æther, and that it is mixed with mucilage, wax, and resin.

The capsicum is easily [illegible] in this country. Its seeds are sown in a hot-bed in the beginning of April; the young plants are managed like other tender annuals, and about the end of May they are planted in the open air under a south wall. They will readily ripen their fruit in such a situation.

The fruit or pod of several species of Capsicum is used in different parts of the world, and under different names, as a stimulating condiment with food, or externally as a rubefacient, or internally as a powerful excitant to the nerves of the part with which it comes in contact. The *C. annuum*, or Spanish pepper, the *C. frutescens*, or Chilies, called also Cayenne pepper, and the *C. baccatum*, or bird-pepper, are chiefly employed. They are natives of the East and West Indies, South America, &c., and are of great utility, along with different articles of food, in rousing the energies of the stomach when impaired by the heat of the climate, and thereby assisting digestion. Even birds have recourse to the seeds, and many parrots and other birds die during their voyage or soon after they reach Europe for want of this natural stimulant. The pods contain two distinct principles: the one capsicin, an alcaloid; the other an ethereal oil, which is the stimulating principle: it resides chiefly in the external layers of the fruit and in the seeds.

The bruised pods, or Cayenne pepper, may be employed in the form of a cataplasm as a powerful rubefacient, which in many cases is preferable to common sinapisms. It is also of great service as a gargle, either alone or in conjunction with cinchona and serpentaria in the sore throat, when threatening to run into a state of mortification, of scarlatina maligna. It may also be given internally with the same adjuncts in the same disease. In fevers, both typhoid and intermittent, it is often a useful accompaniment to Peruvian bark; and in many cases of dropsy from debility, along with iron, it is of great benefit. But it is in dyspepsia, dependent upon atony of the stomach, that it is most serviceable. Vinegar which has acquired its virtues (Chili vinegar) is the most suitable accompaniment to all kinds of fish at dinner.

CAPSULE, a vague name given by botanists to any kind of dry seed-vessel containing many cells and seeds. It usually opens by valves.

CAPTAIN (from the French *capitaine*, which comes from the Latin *caput*, a head), in the naval service, is an officer having the government of a ship of war, and, in the army, is one who commands a troop of cavalry or a company of infantry.

In military affairs the title of captain seems to have been originally applied, both in France and England, like that of General at present, to officers who were placed at the head of armies or of their principal divisions, or to the governors of fortified places. Père Daniel relates that it was at one time given to every military man of noble birth: and adds that, in the sense in which it is at present used, it originated when the French kings gave commissions to certain nobles to raise companies of men, in proof of which he quotes an ordonnance of Charles V. This must have been before 1380, in which year that king died. In the English service the denomination of captain, in the same sense, appears to have been introduced about the reign of Henry VII., when it was borne by the officers commanding the yeomen of the guard, and the band of gentlemen pensioners. Grose's *Military Antiquities*, vol. i.

The established price of a captain's commission is, in the Life Guards, 3500*l.*; in the Dragoons, 3225*l.*; in the Foot Guards, with the rank of lieutenant-colonel, 4800*l.*, in the infantry of the line, 1800*l.*; and no officer can be promoted to the rank of captain until he has been two years an effective subaltern. The full pay of a captain in the Life and Foot Guards is 15*s.* per day; in the Dragoons 14*s.* 7*d.*; and in the Infantry of the Line is 11*s.* 7*d.* per day.

The duty of a captain is one of considerable importance, since that officer is responsible for the efficiency of his company in every qualification by which it is rendered fit for service; he has to attend all parades; to see that the clothing, arms, &c., of the men are in good order, and that their pay and allowances are duly supplied. When the army is encamped, one captain of each regiment is appointed as captain for the day; his duty is to superintend the camp of his reg[illegible] the parading of the regimental guards, to visit [illegible]spital, to cause the roll to be called frequently and at uncertain hours, and to report everything extraordinary to the command[illegible] officer.

A high degree of responsibility rests upon the commander of a ship of war, since to him is committed the care of a numerous crew, with whom he has to encounter the dangers of and the chances of battle. And as the floating fortress with its costly artillery and stores, when transferred to the enemy, increases by so much his naval strength, it is evident that nothing but utter inability to prevent him from getting possession can justify the commander in surrendering. In the old French service the captain was prohibited from abandoning his ship under pain of death: and in action he was bound under the same penalty to defend it to the last extremity: he was even to blow it up rather than suffer it to fall into the enemy's power.

The pay of a captain in the navy varies with the rate of the ship, from 61*l.* 7*s.* per month for a first-rate, to [illegible] 17*s.* for a sixth-rate. Commanders of sloops have 23*l.*, and a captain of marines 14*l.* 14*s.* per month.

From the book of general regulations and orders it appears that lieutenants of his majesty's ships rank with captains of the army. Commanders (by courtesy entitled captains) rank with majors. Captains (formerly designated post-captains) with lieutenant-colonels; but after three years from the dates of their commissions they rank with full colonels.

The rank of post-captain was that at which when the commander of a ship of war had arrived, his subsequent promotion to a *flag* took place only in consequence of seniority, as colonels of the army obtain promotion to the rank of general officers. Such captain was then said to be *posted*; but this title does not now exist.

Several petty-officers in a ship bear the title of captains. Thus there is a captain of the forecastle, a captain of the hold, captains of the main and fore-tops, of the mast, and of the afterguard.

CAPUA is finely situated in one of the richest parts of the Terra di Lavoro, in a plain on the left bank of the Volturno, a broad and rapid river which washes its walls. It is 15 miles N.W. of Naples, on the high road to Rome, about 12 miles from the embouchure of the Volturno, and 10 from the nearest part of the Mediterranean. Being the only fortress that covers the approach to Naples by land, it is regularly and strongly fortified. Part of the town is very well built: its oldest buildings are of the middle ages, but many broken Roman inscriptions, fragments of columns, friezes, &c., mixed up in the walls of churches and houses, point to more remote and more civilized times. The present population is nearly 10,000.

The modern city does not stand upon the same ground as the antient, but it occupies the site of a much inferior town, called by the Romans Casilinum; and Santa Maria di Capua, a larger, more industrious, and more prosperous town than Capua itself, covers part of the ground of the extensive and once powerful city of Capua. Santa Maria is on the same bank of the Volturno, but nearly two miles higher up the river: at that point the remains of antient edifices are very considerable. Capua was one of the Etruscan cities founded on this coast, and its old name was Vulturnum. (Livy, iv., 37.) When it fell into the hands of the Samnites it took the name of Capua, either, says Livy, from Capys their leader, or from its situation in a plain. Whatever may be the true explanation of the word, the adjective Campanus (Ager) is evidently formed from Capua. [CAMPANIA.] Hannibal spent a winter in this town during his campaign in Italy. In the course of this war the Romans formed the siege of Capua, which adhered to the side of Hannibal (Livy, xxv., 20); when the place was taken by the consuls Fulvius and Appius Claudius, the senators were put to death, about 300 nobles were shut up in prison, and the bulk of the citizens sold for slaves. Capua at this time was probably a larger and wealthier city than Rome. There is an amphitheatre which resembles the colosseum of Rome in its form, and which, though far less gigantic, is not deficient in grandeur. From this fine ruin, Mons Tifata, often mentioned by Livy, and the somewhat more distant and much grander Taburnus, the olive-bearing mountain of Virgil, present themselves with admirable effect. At the roots of the Tifata, about three miles from the town of Santa Maria, there are some copious sources of hot mineral waters, which, though some scattered marbles seem to show that they were used by the antient Capuans as baths, are now merely made use of to turn a few mills. [illegible] is altogether curious, is called by the [illegible] *fischi* (the three whistles). In the outs[illegible] and on the roads that branch off from Caserta, Naples, and Nola, there are [illegible] displaying a variety of sepulchral for[illegible]

The European ma-
their produce. The
pally of cacao, cotton,
well as live cattle,
columbia.)

CARACCI, or **CARRACCI, LODOVI'CO, AGOSTINO**, and **ANNI'BALE**, three of the first painters of Italy, kinsmen, fellow-students, and fellow-labourers, were natives of Bologna, and founders of the Bolognese School. Lodovico was born in 1555, and was placed at an early age with Prospero Fontana to study painting. He made such slow progress, that his master dissuaded him from the pursuit; upon which he left Fontana, and thenceforth studied the works only of the great masters, for which purpose he travelled to Venice (where he became acquainted with Tintoretto) and Parma. Returning to Bologna, he found his cousins Agostino and Annibale so well inclined to his profession—for which they had evinced an early taste by scribbling sketches in their school-books,—that he persuaded their father, a respectable tailor, to leave their education to him. Agostino, who was born in 1557, had been intended for one of the learned professions; but his inclination led him to seek employment with a goldsmith, whose business he attended to for a time. He learned engraving from Cornelius Cort, and attained to such excellence, that many of his engravings are only distinguishable from his master's by the superiority of the drawing: his works in that style are highly valued. His cousin placed him with P. Fontana, and afterwards with Passerotti. He never practised painting however with any constancy, but indulged a versatile ingenuity in various pursuits connected with literature and the liberal arts, working at his easel by fits and starts.

Lodovico retained Annibale with himself. Annibale exhibited a perfect contrast to the phlegmatic calmness of Lodovico, to the accomplished fickleness of Agostino, and to the amiable mildness of both: he was rude and impatient in temper, though of so open and generous a nature, that he is said to have kept his colours and his money in the same box, both of which were equally at the disposal of his scholars. He laboured in his vocation with an unwearying and enthusiastic devotion, and a singleness of purpose which has never been excelled, perhaps not equalled. He disliked all study but that of painting, and more than once burst out into complaints against the school-like refinements and the slow proceedings of his kinsmen in their pursuit of excellence. Like Lodovico he travelled about from place to place, improving himself by all that he saw, and aiming to combine in his own works the excellencies of the great works that he studied. The three opened an academy in Lodovico's *studio*, which became famous for the illustrious pupils whom it sent forth.

The fame of the Caracci reaching Rome, Annibale was invited by the Cardinal Odoardo Farnese to adorn his palace with paintings. He went, accompanied by Agostino, and the two brothers were delighted and exalted by the sight of the antient works of art, and the labours of Michel Angelo and the divine Raphael. The usual dissensions however arose, and Annibale's intolerant devotion to labour drove away his more festive brother. The Farnese gallery occupied Annibale for eight years, for which he is said to have received only five hundred crowns; a meanness of remuneration, as Lanzi justly observes, almost incredible. He did little after this, and died in 1609. He was buried, according to his own desire, by the side of Raphael. Agostino died in 1602: Lodovico lived until 1619.

The works of the three kinsmen are principally in Bologna and Rome. The Farnese Gallery is considered the greatest work of Annibale. The Louvre contains the 'St John the Baptist,' by Lodovico and the 'Communion of St. Jerome,' by Agostino, which are respectively reckoned their best works in oil (Malvasia.) [BOLOGNESE SCHOOL.]

CARACCIOLI [NELSON, LORD.]

CARA'CTACUS. [BRITANNIA.]

CARA'FFA, a distinguished Neapolitan family, divided into many branches, all descended from Filippo Caraffa, lord of Spinalonga, who died in 1220. The princes of La Roccella, Sanseverino and Belvedere, and the dukes of Mataloni, Mondragone, and Andria, are all branches of the Caraffa family. There have been in the family one pope (Paul IV.), many cardinals, archbishops and bishops, one grand master of the Order of Malta, &c.

CARAGA'NA, a genus of papilionaceous yellow-flowered shrubs, formerly comprehended in Robinia. Several species are cultivated in gardens, but they are not much valued. They are exclusively found in Asiatic Russia, Tartary, and the north of India; one of them, the *Caragana gerardiana*, is one of the plants called *Tartarian furze* by travellers.

CARAMA'NIA or **KARAMANIA**, a large and important part of Turkey, comprising nearly the whole of the S. coast of Asia Minor, which is described under the general head of ANATOLIA, vol. i., and under that of ASIA, vol. ii. This extensive sea-bord, which, measuring from the Gulf of Iskenderoon, or Scanderoon, to the Gulf of Makri, is upwards of 400 miles long, is divided into pashaliks or governments bearing different names, and, according to Captain Beaufort, the appellation 'Caramania' is neither used by the present inhabitants nor is recognised at the seat of government. The name is not classical, for in antient times the provinces called Lycia, Pamphylia, the two Cilicias, with parts of Caria and Phrygia, occupied the country which we call Caramania. In the middle ages, however, a kingdom or state called Karamanly, from the name of Karaman, the founder of it, did exist here, and comprised all the antient provinces which we have mentioned; but after a struggle of two centuries it was conquered by the Osmanli Turks under Bajazet II., about 1485.

The fertile and beautiful district of Adana (the Cilicia Campestris of the antients) was ceded by the Porte to the pasha of Egypt in the treaty of peace concluded between those powers on the 4th of May, 1833. This is the best-cultivated part of Caramania. Solitude, desertion, and wretchedness reign over nearly all the rest of the long line of coast, where the frequent and splendid ruins of Grecian and Roman cities indicate a prosperity and wealth that have long been past. (Captain Beaufort's *Survey*, 8vo. London, 1817.)

CA'RANX, a genus of fishes of the order *Acanthopterygii* and family *Scomberoides*, distinguished chiefly by the lateral line of the body being furnished with a series of scaly plates. These plates are horizontally keeled (especially on the posterior half of the body), and frequently terminate in a spine or an angular projection, the point of which is directed backwards. The remainder of the body is covered with small scales. There are two distinct dorsal fins; the last rays of the posterior one are sometimes but slightly connected by membrane, or separated into spurious fins. Some free spines are placed before the anal fin. The teeth are very minute.

Several species of this genus inhabit the seas of Europe, but we are aware of only one which has occurred off the British coast. The fish, well known by the name of *scad* or *horse-mackerel*, is frequently met with on various parts of the coasts both of England and Ireland, and at times occurs in such immense shoals, that the whole sea as far as the eye can reach appears alive with them.*

The scad is about the size of the mackerel, to which it comes near in affinity. The body is more even in width (*i. e.* less tapering towards the head and tail), and is of a dusky olive colour above, exhibiting in certain lights splendid hues of blue and green: the lower part of the body is silvery white, with the exception of the throat, which is black; there is also a black spot just above the pectoral fin.

This species, like many others found on our own coasts, occurs also on those of the Mediterranean.

In some of the species of the genus caranx the scaly plates are observable only on the posterior half of the lateral line, and the anterior part is furnished with small scales.

Caranx punctatus of Cuvier has but a single spurious dorsal and anal fin, whilst the *C. Rotleri* (*Scomber Rotleri* of Bloch) has several.

Scomber dentus (Bloch) and one or two other species now included in this genus are remarkable for having a single range of teeth and the body of a more elevated form.

C. carangus (*Scomber carangus* of Bloch), a large species of this genus from the Antilles, weighing from twenty to twenty-five pounds, is of a silvery hue, and has a black spot on the operculum; the body is compressed, and of a somewhat ovate form; the head is obtusely terminated. This fish is good eating, whilst the bastard *carangue* (*C.*

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* Mr. Yarrell, in his 'History of British Fishes,' records an instance of this nature which occurred off the coast of Glamorganshire. The account, which was communicated by Mr. Bicheno, is as follows:—'They were first observed in the evening, and the whole sea, as far as we could command it with the eye, seemed in a state of fermentation with their numbers. Those who stood on some projecting rock had only to dip their hands into the water, and with a sudden jerk they might throw up three or four. The bathers felt them come against their bodies; and the sea, looked on from above, appeared one dark mass of fish. Every net was immediately put in requisition; and those which did not give way from the weight were drawn on shore laden with spoil.' * * * * 'The quantity is very inadequately expressed by numbers,—they were caught by cart loads. As these shoals were passing us for a week, with their heads directed up channel, we had the opportunity of noticing that the feeding time was morning and evening. They were pursuing the fry of the herring, and I found their stomachs constantly full of them.'

(Guaraterebra), another, which closely resembles it, but wants the black spot, is apt to prove poisonous.

CARANXO'MORUS, a genus of fishes of the order *Acanthopterygii* and family *Scomberoides*. [Coryphæna.]

CA'RAPUS, a genus of fishes belonging to the apodal Malacopterygians. [Gymnotus.]

CARAT, KARAT. The karatium (κεράτιον ?) was originally the twenty-fourth part of the *marc*, or half-pound among the French from whom the word came: so that three carats made an ounce. Eisenschmidt cites a coin of Charles VII., of an ounce weight, bearing the legend—

> 'D'or fin suis, extrait de ducats
> Et fus fait pesant trois karats.'

The carat was a small weight used for gold and jewels, and (Paucton) varied greatly in different countries. But at last it went out of use, except only in the sense in which it still exists, namely, that a carat means the twenty-fourth part of any weight of gold or gold alloy. If such a weight be all gold, it is said to be twenty-four carats fine; if one-third only be gold, it is said to be eight carats fine.

The karath occurs (Ducange) in an old English charter as a measure of wine; but this is the *carrada* or *carrata* formerly used as a measure of liquids, and supposed to be the quantity which could be carried in a *carrus* or car.

CARAU'SIUS. [Aureus and Britannia.]

CARAVA'GGIO, MICHELANGELO AMERIGHI, or MORIGI, called **DA CARAVAGGIO**, from a town of that name in the Milanese, in which he was born about the year 1569. His father worked at Milan as a labouring builder. The son derived his first love of the art, together with such knowledge as he could pick up, in the service of certain artists as a colour-grinder. In course of time he managed to go to Venice, where he studied the works of Giorgione with great success, and some of his pictures in the style of that [illegible]riod are much esteemed. He afterwards went to Ro[illegible] where finding difficulty in getting employment he [illegible]gaged with a trafficking artist, called Arpino, for wh[illegible] he principally painted flowers and fruit. This [illegible]n quitted, and commenced painting in the [illegible] style which he ever after pursued. He made [illegible] resolution to study no more from artificial models, but t[illegible] adhe[illegible]simply to nature, such as he found it in the streets and alleys of Rome. Neglecting his early studies at Venice, he [illegible]umed a manner characterized by dark and gloomy sha[illegible] illumined by a scanty twilight, as if he painted in a [illegible]er. Having quarrelled over some game with a com[illegible]n, whom he killed, he fled to Naples: from Naples he went to Malta, where he was made a knight: but here, too, he quarrelled with a person of rank, and was thrown into prison. Though he made his escape to Sicily, vengeance pursued him, and he was assaulted by a party of armed men, and grievously wounded and disfigured. His friends having obtained a pardon from the pope for the murder, he set out for Rome, but unfortunately, on landing, he was taken into custody by mistake, and upon being released, could no longer find the vessel which had all his property on board. Exhausted with fruitless endeavours to find the vessel and his property, he endeavoured to make the best of his way to Rome. The heat, his yet unhealed wounds, and anxiety of mind, brought on so violent a fever, that he could barely reach the Porta Ercolo, where he sat down upon a bank and presently expired, at the age of forty, in the year 1609. Caravaggio was rude and negligent in his person and habits; he scarcely retained a friend, and he defied all rules of civility and decency.

The principal merit of his pictures consists in the colouring, which is pure and vigorous; the tints are few, but true to nature. Annibale Caracci said of him that he 'ground flesh' (and not colour). The obscurity in which he involves his design gives it a certain air of mysterious grandeur; but his figures are replete with the unredeemed vulgarity of the models from which he studied, and the extravagance of a self-taught conceit aggravated by abandoned habits. His principal works are a 'St. Sebastian,' in the Capitol at Rome, a 'Supper at Emmaus,' in the Borghese Palace, and the 'Entombment of Christ,' now in the Louvre, which in its original place in the Chiesa Nuova was considered to eclipse the rival altar-pieces by Baroccio, Guido, and Rubens.

Among the number of his imitators, says Lanzi, there is not a single bad colourist; Guercino and Guido, and even Annibale Caracci, are said to have profited by the study of his works. (Baldinucci.)

CARAVAN, a travelling body of merchants or pilgrims, who join company for safety and convenience. The term, which is of Persian origin (*Cârwân* in Persian having the same signification as Caravan in English), is confined to journeys in the East, and applies more particularly to those made in Arabia, Nubia, Syria, Persia, and Asia Minor, but the practice obtains, though mostly on a smaller scale, in many other countries where the roads are insecure, and where deserts or desolate tracts of land are to be crossed.

In the East the caravans have a commercial or a religious character, and very frequently both; the greatest of them all, or those which proceed annually to the holy city of Mecca, have always trade as well as prayers in view. These caravans are regularly organized by government, and placed under the direction of officers of high rank, who assign to the different travellers their proper place in the long line of march, and see that good order is maintained. Sixty thousand men and 20,000 camels sometimes arrive at Mecca with the Hadji or pilgrim caravans. But this amount is insignificant, compared with the numbers that flocked to the holy city in other ages. It is said that when the mother of Motasem b' Illah, the last of the Abbasides, performed the pilgrimage, in the year 631 of the Hegira (A.D. 1254), her caravan was composed of 120,000 camels. In our times, the Syrian caravan, as it is called, though it first starts from Turkey, has been the most numerous and the best regulated; yet, according to Burckhardt, who saw it at Mecca in 1814, it did not consist of more than 15,000 camels. This caravan sets out from Constantinople, or rather from the Asiatic suburb Scutari, and collects pilgrims and traders all through Anatolia and Syria. During this part of the route great care is taken for the safety and comfort of the travellers: the armed forces of different pashas and local governors escort them from town to town, and the munificence of former sultans has amply provided caravan-serais (caravan-inns) and fountains of pure water by the road-sides. On arriving at Damascus, the caravan is under the protection of the pasha of Damascus, who derives both honour and profit from the charge. At this pleasant city it generally remains three or four weeks, in order to prepare for a journey of thirty days across the desert. Here also the camels are changed, the Anatolian camel not being considered fit for such a journey. When all is ready, the pasha [illegible] Damascus, or one of his chief officers, puts himself at the head of the caravan, which he accompanies to Mecca. The signal for encamping and starting is the firing of a musket. On its route across the desert, where marauding Arabs are always [illegible] the look-out, a troop of horse rides in front, and another in the rear to bring up the stragglers. The different parties of travellers, who are distinguished by their provinces or towns, keep close together, and each party knows its proper station. The usual arrangement of the hadjis is to contract with a mekowem, a man who speculates in the furnishing of animals and provisions, has his camels, tents, servants, meat, coffee, &c., and who takes upon himself all the trouble and expense for a given sum.

The Egyptian pilgrim caravan, which starts from Cairo, is regulated in much the same manner; but it is not so large, and its route, by the head of the Red Sea, and through a country where fierce Beduin Arabs are plentiful, and wells of water very scarce, is much more dangerous.

The Persian caravan to Mecca, which used to come by Bagdad through Mesopotamia and Syria, and the Moggrebin (or Moorish) caravan, which, starting from Marocco, used to travel all through Northern Africa, have both become very irregular, though many Persians, Moors, and negroes find their way to Jidda, the port of Mecca, by sea. Considerable troops of Mohammedan Indians also visit Mecca. The great Indian caravan, which started from Muscat and travelled by Nejd to Mecca, has long been given up.

When the caravans arrive at Mecca, bringing with them goods from so many parts of the world, that city presents the appearance of a vast fair. In former times there was a second great pilgrimage and fair at Medina. A caravan of many hundred merchants, all mounted on dromedaries (this was called a 'light caravan'), and preceded by their goods on the slower camels (the heavy caravan), went from Mecca to Medina; but this caravan also is on the decline.

Besides these large annual caravans, others on a smaller scale are constantly occurring in the East, where merchants and travellers going the same road wait for one another until they can form a caravan, when they generally appoint one of their voluntary association to regulate the order of march. For further information, see Burckhardt's *Travels in Syria*, p. 2[illegible]; Id., *Travels in Nubia*, vol. i., from p. [illegible] to p. 38. In the *Faithful Account of the Religion and Manners of the Mahometans, &c.*, written about a century ago, by Joseph Pitts, an English sailor, who went from Algiers to Mecca and Medina, are several good descriptions of the caravans.

But the caravan trade is not limited to Southern Asia. The great trade between China and Russia is a caravan trade. The road runs from Peking through the great wall to Chalgan, where the goods are taken from horses and put upon camels, which are kept and let out for this purpose by the Kalka-Mongols. From Chalgan the route lies through part of the desert of Kobi to Kiachta, the great border-market for the barter of Chinese and European articles: the journey is from 70 to 90 days. Other similar lines of route exist in Russia and the countries to the east of the Caspian Sea.

Among the knights of Malta, in whose history it is continually used, the word caravan had a very different meaning. It signified a troop or corps of knights appointed by the Order to serve in any garrison, and also the crew or the cruise of any of their galleys against the Turks; for such cruises were called caravans, and every knight was bound by the laws of his society to make so many *caravans*, or, in other words, so many sea-voyages.

CARAWAYS, the ripe fruit of *Carum Carui*, an umbelliferous, weedy, European plant, of annual or biennial duration, with finely-divided aromatic leaves, white small flowers, and a fusiform root, not unlike that of a small parsnip. The seeds, as they are vulgarly called, are the furrowed halves of the ripe fruit, have a peculiar aromatic flavour, and are used as an agreeable carminative by confectioners; the roots themselves are eaten in the north of Europe.

Caraways are used in medicine as a carminative, and more extensively by the confectioners, and by the brewers' druggists to give flavour to the beer. The chief English cultivation of the plant is in Essex and Suffolk, upon old grass land broken up for the purpose. As it is a biennial, it is generally sown with another plant of the same tribe called coriander; and sometimes a crop of teazles (Carduus fullonum) is raised on the same land; the three give a very valuable return during two or three years.

Arthur Young, in his 'Agricultural Survey of Essex,' describes this mode of cultivation minutely. Some old pasture land is ploughed up in spring; if the soil is a strong rich clay so much the better. Ten pounds of caraway seed, ten pounds of coriander, and twelve pounds of teazel seed are sown together on the newly turned-up soil, and harrowed in. As the plants appear they are carefully freed from all weeds, by repeatedly hoeing the land. The coriander is fit to be cut in July, and is threshed out on a cloth in the field. The produce is frequently twenty-four cwt., worth on an average 16*s.* per cwt. The next year the caraway is reaped about the same time, and produces twenty cwt. worth 1*l.* per cwt. In the autumn of the same year the teazels are fit to be cut. The produce of these is very various; sometimes a load is obtained worth 12*l.*, at other times only a quarter of a load. The caraway and the teazels continue to produce for several years, provided they are kept clear of weeds; but after the third crop the return is not sufficient to be an inducement to continue them longer on the ground. The land, which would have been too rich for corn when first broken up, is now reduced to a moderate state of fertility. From this it is evident that it is only under peculiar circumstances that this profitable cultivation can be adopted.

CARBAZOTIC ACID. This acid, which has also been called nitropicric acid, results from the action of nitric acid upon a great number of vegetable and animal substances. The largest quantity is furnished by indigo: one part of this substance reduced to coarse powder is to be gently heated with eight or ten times its weight of moderately strong nitric acid. The indigo dissolves with the evolution of much nitric oxide gas. As soon as the effervescence is over, the liquor is to be boiled, and nitric acid added from time to time till the evolution of nitric oxide ceases: on cooling, crystals of carbazotic acid are obtained, which are of a brilliant yellow colour; they are to be washed with cold water, dissolved in boiling water, and re-crystallized.

The pure acid is said to crystallize in equilateral triangular laminæ, the primary form being an octahedron with a rhombic base: it reddens litmus paper, and has a very bitter taste, and on this account it was long called *bitter of indigo*; when heated it fuses and sublimes without decomposing. If it be rapidly heated in the air it burns without explosion, leaving charcoal: this acid is but slightly soluble in cold water, but much more so in hot; the solution is of an intense yellow colour; alcohol and æther dissolve it readily; chlorine and iodine do not act upon this acid, even when it is fused in these substances in the elastic state, neither nitric nor muriatic acid, nor aqua regia act upon this acid: it contains no water, and is said to be poisonous.

According to Liebeg, this acid is composed of—

Carbon . .	36·081	or 15 equivalents
Azote .	16·714	
Oxygen	47·205	1[illegible]
	100·	

The saline compounds of this acid are called *carbazotates* or *nitropicrates*. An account of them may be seen in Berzelius's *Traité de Chimie*, tome vi., p. 386.

CARBO. [CORMORANT.]

CARBO, CNEIUS PAPIRIUS, son of Carbo the Roman orator. (Cic. *De Clar. Orat.* 27, 43, &c.) He espoused the party of Marius, and was consul three times; A. U. C. 669 he was colleague with Cinna. Cinna had the administration of Italy, while Carbo took the command in Gaul. When Cinna died Carbo remained sole consul, and opposed Sulla in Italy. He procured from the senate and people a decree declaring all who joined the cause of Sulla enemies to the state. Carbo was afterwards defeated by Pompey, and was at last taken prisoner in Sicily, and brought before his tribunal. Pompey pronounced a violent invective upon him, and ordered him to be led to execution, A. U. C. 671. (Appian, *de Bell. Civ.* vol. i. p. 410.) The ingratitude of Pompey in thus treating a man who had so ably defended him in his youth, when his father's property was going to be confiscated, has been deservedly condemned by Valerius Maximus (v. 3, 5).

CARBON. This element and its combinations act an important part in the mineral constitution of our earth. Following the system of Berzelius, the substances containing it are arranged in three groups, the first consisting of the mineral forms of pure carbon, the second of the carbonates, and the third of those carboniferous masses in which the elements are combined according to the principles of organic chemistry, and which have resulted from vegetable matter.

The first group consists only of two essentially different varieties, namely, the crystallized and the amorphous carbon. The former, as might be expected, is the purer, and is the well known gem, the DIAMOND, under which name it is described: the latter is always mixed with more or less foreign matter, which gives rise to varieties known as graphite or coal-blende, anthracite, and fossil coal.

The second group, the carbonates, present us with a numerous mineralogical family of the highest interest, both in a scientific and in an economical point of view. For the purpose of studying them with the greatest facility the carbonate of lime may be taken as a type, to which the whole family may be conveniently referred. This substance possesses the peculiarity of dimorphism; that is to say, it occurs in forms belonging to two different systems of crystallization, namely, the rhombohedral and the prismatic, and is called, when its crystals belong to the former, CALCAREOUS SPAR, and when to the latter ARRAGONITE, under which terms they have been already described. The chemical composition of these minerals is that of a neutral salt, being one atom of carbonic acid united with one atom of the oxide of calcium, or lime, and therefore the chemical composition of either is denoted by the symbol $\dot{Ca}\,\ddot{C}$. But the oxide of calcium is isomorphous with the similarly constituted oxides of magnesium, barium, strontium, iron, manganese, zinc, cerium, lead, and copper; and each of these oxides occurs combined with carbonic acid in the proportion of atom to atom, some of them producing crystals isomorphous with calcspar, and others on the contrary with arragonite. But in addition to the mineral species produced by the combination of any one of these oxides with carbonic acid, an endless variety of isomorphous crystals is formed by the combination of two or more of the above carbonates, which are capable, according to the laws of isomorphism, of uniting in any proportion, as may be seen in the varieties of calc-spar, which are known as brown-spar, bitter-spar, dolomite, where portions of the oxide of calcium are constantly replaced by the oxides of magnesium, iron, and manganese. None of the carbonates of these oxides are found however, like the carbonate of lime, to be dimorphous, and to occur crystallized both in the rhombohedral and the prismatic system; they may be divided therefore into two isomorphous groups, the one headed by calc-spar, and the other by arragonite; and it is only among the oxides of the same group that it is usual to find the one oxide substituted for the other.

The first group crystallized in the rhombohedral system consist of

Calc-spar . . .	$\dot{Ca}\,\ddot{C}$
Magnesite or talc-spar	$\dot{Mg}\,\ddot{C}$
Manganese-spar .	$\dot{Mn}\,\ddot{C}$
Iron-spar . . .	$\dot{F}\,\ddot{C}$
Zinc-spar	$\dot{Zn}\,\ddot{C}$
Bitter-spar	$\dot{Ca}\,\ddot{C} + \dot{Mg}\,\ddot{C}$
Brown-spar	$(\dot{Ca}\,.\,\dot{Mg}\,.\,\dot{Mn}\,.\,\dot{F})\,\ddot{C}$

The second group crystallized in the prismatic system consists of

Arragonite	$\dot{Ca}\,\ddot{C}$
Strontianite	$\dot{Sr}\,\ddot{C}$
Wetherite	$\dot{Ba}\,\ddot{C}$
White lead	$\dot{Pb}\,\ddot{C}$

But although the minerals of these groups are classified together as being isomorphous, this word cannot be used in its strictest sense, and as denoting an exact identity of the angles of inclination between corresponding planes in the different species, as those when measured at the ordinary temperature are found to differ from each other by small but nevertheless very perceptible magnitudes. The following table of the angles in the terminal edges of the ground-forms of the principal species of the first group, and parallel to the faces of which the cleavage planes of each occur, will best show this difference. According to the most careful measurements the angles are,

For Calc-spar . .	105° 5′
„ Bitter-spar .	106 15
„ Manganese-spar	106 51
„ Iron-spar . .	107 0
„ Talc-spar . .	107 25
„ Zinc-spar . .	107 40

The three angles of calc-spar, bitter spar, and talc-spar, when the chemical composition of these minerals is considered, present a very interesting and striking relation, the angle of bitter-spar being the arithmetical mean between those of the pure carbonates of lime and magnesia, while its chemical composition may be considered also as the mean of the other two, being composed of an atom of carbonate of lime united with an atom of carbonate of magnesia. That this is a particular instance of a more general law, that the increment of the angle in any compound over that of calc-spar is to the whole difference of the angles of the pure minerals, or 2° 20′, in the proportion of the number of atoms of carbonate of magnesia to the total number of atoms in the compound, appears to be established by the analysis and measurements of the French mineralogist, M. Beudant, who has made several experiments for the purpose of ascertaining this fact. An example will at once render this clear. Suppose on measuring the angle of a compound of carbonate of lime and magnesia we find it to be 105° 40′, which gives an increase over 105° 5′ equal to ¼ of 2° 20′; according to the experiments of Beudant we should be justified in concluding that the compound consisted of three atoms of carbonate of lime to one of carbonate of magnesia.

In addition to the carbonates above mentioned, four others are known, namely, the native soda, Gay-Lussite, l'azure or blue copper, and malachite, which, although containing elements isomorphous with the former, are nevertheless differently crystallized, as they are of a different chemical composition, containing water of crystallization.

The third class, all of which contain more or less evidence of their vegetable origin, with the exception of
lite, or honey-stone, are amorphous. Th
guished from other mineral bodies by thei
the combustion being usually accompanied by fl
may be divided into the four principal gro

mineral resins, mineral oils, mineral pitches or bituminous bodies. The principal varieties are distinguished by and are described under the names of peat; coal and its varieties, brown coal, &c.; amber, honeystone, retinasphaltum, naphtha, petroleum, mineral pitch, asphaltum.

CARBON, a non-metallic elementary solid body, which is widely diffused throughout nature. The purest, and at the same time the rarest form in which it occurs is that of the diamond [Diamond]; the more common states in which it is met with are those of anthracite, graphite, and coal; but in these cases it is not free from admixture.

Another well-known form of carbon, but still impure, is charcoal, obtained from the decomposition of wood by heat.

The diamond differs so entirely in its obvious and physical properties from carbon in its more common states, that nothing less than the most decisive evidence of the identity of their chemical nature could have allowed of their being arranged together: the proof of their similarity is stated in the article Carbonic Acid. According to the circumstances under which carbon occurs naturally or is artificially procured, it possesses different properties and characters: we shall therefore first briefly mention some of these forms.

Anthracite (which see), consists almost entirely of carbon in the black state in which it exists in charcoal. Kilkenny coal, which is one of the varieties, leaves when burnt about 4 per cent. of ashes; a variety of anthracite found in Pennsylvania yielded—

Carbon . .	90·
Water . .	6·
Silica . .	1·
Alumina . .	1·
Oxide of iron and manganese	0·2
	99·2

The small portion of substances with which the carbon in the anthracite is mixed is to be regarded as accidental, and it is to be considered as mineral carbon nearly pure.

Graphite [Graphite], or as it is sometimes called plumbago and black lead, is another variety of mineral carbon, and is sometimes almost pure: it contains variable quantities of oxide of iron in a state of mixture; in some cases scarcely amounting to more than 0·05 per cent.

Most of the varieties of coal differ from anthracite and graphite in containing azote and hydrogen in addition to earthy and metallic impurity; still, however, they all consist principally of carbon. [Coal.]

The proof that they contain the gaseous elements just alluded to is, that they furnish ammonia by distillation.

There are various other mineral products which contain carbon, as bitumen, naphtha, petroleum, amber, &c.; but although it exists in them in large proportions, they also contain a considerable portion of other elements, as already stated with respect to coal. Another state in which carbon occurs very largely is that of combination with oxygen, forming Carbonic Acid. This acid enters into the composition of chalk, limestone, marbles, some other earthy, and also some metallic carbonates.

Charcoal has already been mentioned as carbon procured from the decomposition of wood by burning. This operation is generally conducted in pits made in the ground; sometimes however it is carried on in iron cylinders. Wood is essentially composed of carbon, oxygen, and hydrogen; by the action of the heat it is decomposed, the oxygen and hydrogen are expelled, and uniting in certain proportions form water, and also with carbon various gaseous and other compounds are formed. Among the latter are acetic acid, sometimes called pyroligneous acid, and a peculiar inflammable fluid, known by the name of pyroxilic spirit, and tar.

The remaining charcoal has the following properties: it is black, lighter than water, and full of pores, occasioned by the expulsion of the bodies volatilized. The heavier the wood from which the charcoal is obtained, the denser it is.

Charcoal, from whatever source prrocured, is absolutely infusible by any degree of heat however great; neither that of a mirror, the oxyhydrogen blow-pipe, nor the voltaic discharge, being sufficient to produce fusion. In its common state it is one of the worst conductors of heat known, but its power is increased after being strongly heated. Charcoal is a conductor of electricity, which is so far from being the case with the diamond, that it may be rendered electrical by friction.

Charcoal is tasteless, inodorous, and insoluble in water. It possesses the property of destroying colouring matter, especially the charcoal procured by burning bones, which is usually called animal charcoal; it is largely used for this purpose in sugar-refining.

Charcoal, in common with other porous bodies, has the power of condensing gaseous bodies; but to a greater degree than most, or perhaps any other substances: graphite, on account of its compactness, does not possess this quality.

Saussure performed experiments to ascertain these facts by plunging a piece of red hot charcoal under mercury, and introducing it when cool into the gas. He found that box-wood charcoal absorbed in 24 to 36 hours the annexed quantities of the following gases:—

Hydrogen .	1·75	times its volume.
Azote . .	7·5	,,
Oxygen .	9·25	,,
Carbonic oxide	9·12	,,
Olefiant gas .	35·	,,
Carbonic acid .	35·	,,
Nitrous oxide .	40·	,,
Sulphuretted hydrogen	55·	,,
Sulphurous acid .	65·	,,
Muriatic acid .	85·	,,
Ammoniacal gas .	90·	,,

These effects appear to depend entirely upon the mechanical action of the pores of the charcoal, for the gases are not at all absorbed in the ratio of their affinity for carbon, but generally according to the facility with which they are condensed; and thus it is that charcoal absorbs vapours more readily than gases, and liquids than either.

Charcoal is highly combustible; it burns in the air when strongly heated, though not very rapidly; during this combustion carbonic acid is formed by the union of the oxygen of the air with carbon.

It has been mentioned that charcoal is not pure carbon, and when a quantity is burnt there always remains a portion of ashes containing a considerable quantity of carbonate of potash and some other alkaline and earthy salts, which have been taken up from the soil in which the tree grew that furnished the charcoal.

Charcoal is used not merely for combustion, but also for the important purpose of making gunpowder. It is also applied to other various well-known uses. Carbon unites with all the elementary gases to form highly-curious and interesting bodies. Its compounds with oxygen are treated of under Carbonic Acid, Carbonic Oxide, and Oxalic Acid: those which it forms with hydrogen under the head of Hydrogen: with chlorine, Chlorides of Carbon, and with azote, Cyanogen. It combines also with sulphur to form sulphuret of carbon, and it enters into the composition of several ternary compounds.

Carbon, in an impure state, or charcoal, is employed medicinally, both internally and externally. Its power of absorbing gases and moisture renders it useful in some cases, while in other cases it seems to act by some power exerted on the vital energies of the system. A few grains of vegetable charcoal taken into the stomach cause a feeling of warmth and comfort in that organ, followed by a slight increase of the heat of the body generally. A considerably larger dose will occasion vomiting, and even diarrhœa. Charcoal, especially animal charcoal, possesses the power of destroying the colour, smell, and taste of a great variety of vegetable and animal substances, particularly of mucilages and oils, and of matters in which *extractive* abounds. Allowed to remain in contact with valerian, galbanum, balsam of Peru, or musk, it destroys their characteristic odour and properties.

Meat and game, too far decomposed, may be restored to a condition fit for use by the employment of finely-powdered charcoal, assisted by sulphuric acid. Water also may be restored from a tainted state by filtering it through charcoal. The interior of water-casks is charred in order to preserve the water in a pure state. Leeches, fish, &c., live better in water kept in charred vessels than in those of any other kind.

Charcoal, both from its antiseptic and vital properties, is useful in many forms of fever, especially the bilious, remittent, and intermittent fevers of warm climates, given during the interval of the vomiting of the black matter; and in yellow and typhoid fevers. It is also serviceable in dyspepsia, accompanied with fetid breath and eructations. It is sometimes of service in ulcerations of the tongue and fauces, connected with depraved digestion. It is likewise useful in obstinate constipation, given in doses of two or three dessert-spoonsful every half-hour, or each hour, for a period of perhaps eighteen hours. In smaller doses it has been found useful in dysentery, where the motions are acrid and very offensive. Externally it is a beneficial application to foul ulcers, applied either in the form of fine powder, or as a cataplasm. Persons who are troubled with excessive and strong-smelling perspirations of the feet find the inconvenience lessened by sprinkling the inside of their stockings with fine-powdered recently-prepared charcoal. Finely-powdered charcoal may also be employed as a styptic. Charcoal, especially that procured from the cocoa-nut, forms, along with either prepared chalk, rhatany-root, kino, or catechu, perhaps the best tooth-powder which can be employed when the gums are spongy and the breath fetid. A liniment of charcoal is sometimes useful in herpes, ringworm of the scalp, and other cutaneous diseases.

Animal charcoal, particularly that prepared from the flesh and bones of calves, given in the dose of a few grains, three or four times a day, is said to be very efficacious in removing chronic enlargements of the glands.

CARBONATE, a salt composed of carbonic acid and a base. The carbonates are an important class of salts: some of them, as the carbonates of lime and magnesia, and the metallic carbonates, are decomposed by heat; but the carbonates of potash and of soda do not suffer any alteration by exposure to it. For the various carbonates see the different alkaline, earthy, and metallic bases.

CARBONIC ACID. There are three compounds of carbon and oxygen, viz., carbonic oxide, consisting of one equivalent of each of its elements, or six parts of carbon and eight of oxygen; carbonic acid, formed of one equivalent of carbon and two equivalents of oxygen; and oxalic acid, containing two equivalents of carbon and three equivalents of oxygen.

Carbonic acid was long known and observed to exist in various forms, and to be produced in different circumstances, before its nature was understood and its composition ascertained. Van Helmont recognised it as a peculiar matter, and called it *gas sylvestre*; Hales supposed it to be spoilt common air; Black gave it the name of *fixed air*, and made many curious and original experiments upon some of its compounds, showing that the causticity of the alkalis and lime depended upon its absence; Bergmann proved that it was an acid, and called it *aërial acid*; but Lavoisier first pointed out its true nature, and in consequence of his discovery it received the name of carbonic acid, which it still retains.

Carbonic acid exists largely in nature. It is in comparatively small quantity in the gaseous state in the atmosphere; it is in solution in most spring water, and in some called mineral waters to a considerable degree; but it is in solid combination that it is found in the largest quantity, forming nearly 44-100ths of all limestones and marbles, besides occurring in less quantity united with other earths and metallic oxides.

Carbon and oxygen do not appear to combine, or, if at all, very slowly at common temperatures, by direct action; but certain compounds which contain carbon, when undergoing the process of fermentation, yield a large quantity of carbonic acid. [Fermentation.]

It is also produced during the process of respiration; by animal and vegetable putrefaction; and by combustion, whether of oil, wax, tallow, vegetable matter, or coal.

It appears therefore that carbonic acid may be formed by the mere combustion of any substance containing carbon; but the method of forming it in purity is to ignite and burn either charcoal or the diamond in oxygen gas; and it is found, that when 100 cubic inches of oxygen have combined with as much carbon or diamond as this quantity of gas is capable of taking up by combustion, there remains precisely as much in volume of carbonic acid gas as there was of oxygen employed. Thus 100 cubic inches of oxygen, weighing 34·4 grains, combine with 12·9 grains of carbon without any alteration of volume, and consequently 100 cubic inches of this gas weigh 47·3 grains, or its density is to that of atmospheric air as 1·526 to 1. By some chemists it is hypothetically regarded as composed of one volume of oxygen gas and one volume of the vapour of carbon, condensed into one volume. By weight it consists of

2 equivalents of oxygen = 16
1 " carbon = 6
Equivalent

It contains twice as much oxygen as the bases which it saturates to form neutral carbonates.

When carbonic acid is required for experiment, it is usual to evolve it by decomposing a carbonate, rather than to form it by the combination of its elements, as above described. For this purpose, carbonate of lime, or chalk, or marble, may be put into a retort, and dilute muriatic acid being poured upon it, carbonic acid is plentifully given out; and although this gas is to a certain extent soluble in water, it may be received in jars filled with and inverted in water.

Carbonic acid gas is colourless and transparent, and therefore invisible; it has an acid and slightly astringent taste; it reddens litmus paper, but the blue colour returns as the acid volatilizes. It extinguishes burning bodies, and is fatal to animals. On account of its great density, it diffuses slowly in the air, and hence it is apt to remain long in fermenting vats, old wells, &c., and has frequently produced fatal effects upon persons descending into them. Atmospheric air may however contain 1-20th of its volume of this gas, and be respired without becoming hurtful. On account of its great weight, it may be poured from vessel to vessel, as is shown by its extinguishing a taper repeatedly.

Carbonic acid, though gaseous at common temperatures and pressures, may be compressed into a liquid state, as shown by Mr. Faraday; and by the more recent experiments of M. Thilorier, it appears to have been rendered even solid. Mr. Faraday's method of operating may be seen in the *Phil. Trans.* for 1823. The liquid carbonic acid produced is limpid, colourless, extremely fluid, and refracts light less than water does. At 32° it requires a pressure of thirty-six atmospheres to retain it in a liquid state; in endeavours to open the tubes at one end, they always burst into fragments with a powerful explosion. M. Thilorier found that a jet of liquid carbonic acid received in a glass vial expanded to about 400 times its own volume, and by this produced so great a degree of cold, that one part of the carbonic acid congealed into a white powder, adhered to the glass, and retained its solidity for some minutes without pressure. It has already been mentioned that carbonic acid gas is soluble in water, and various contrivances have been adopted for impregnating water and saline solutions with it, to imitate natural mineral waters. Among these, Dr. North's apparatus is well known, and is described in most works on chemistry. At the average temperature and pressure, water takes up its own volume of carbonic acid gas, and under a pressure of two atmospheres it dissolves twice its volumes and so on. The water thus impregnated becomes brisk and tart, and reddens litmus paper; when the water is boiled, the carbonic acid is expelled. Carbonic acid is detected by the properties of extinguishing flame, proving fatal to animals, reddening litmus paper, but not permanently, and giving a precipitate with lime water; this precipitate is carbonate of lime, which is re-dissolved by an excess of carbonic acid, and re-appears when that excess is expelled by heat.

Carbonic acid, though in small quantity, always exists in the atmosphere, as may be shown by exposing lime-water to the air; the proportion does not usually exceed about one 2000th of the volume of the air; it is produced by the processes of respiration, combustion, and animal and vegetable decomposition, as already alluded to.

Carbonic Acid Gas, in a state of concentration, acts upon the human system as a powerful sedative poison. Unless largely diluted with atmospheric air, it cannot be breathed, as it stimulates the glottis, or entrance to the windpipe, to contraction, which causes the person exposed to this gas to die of suffocation. But even when so far diluted as to be able to pass the glottis, and enter the lungs, it acts as a poison; and also when brought in contact with the skin (pure atmospheric air being breathed at the same time), or with the mucous membrane of the stomach. A variable quantity of carbonic acid gas exists at all times in the air, as essential to the respiration and the life of plants; but any considerable increase of this quantity is deleterious, and destructive to the life both of animals and vegetables, though plants will flourish in an atmosphere containing nine or ten per cent. of carbonic acid gas, provided they are exposed to the direct solar light, for this quantity is poisonous to them in the shade. (Saussure.) The cause of the absence of vegetation in the celebrated poison valley of Java is the existence of a subterranean source of carbonic acid gas, and not the shade of the upas-tree, as is popularly believed.

Carbonic acid gas is evolved from the combustion of fuel, especially charcoal, and during the process of fermentation; from the coloured parts of the flowers of plants, both by night and day, and from the green parts of plants during the night; from the calcination of lime; and it is apt to be formed and accumulate in mines, particularly coal-mines, where it is termed *choke-damp*, and in old draw-wells. It also is formed or extricated by the respiration of animals, and becomes the source of disease and death when many human beings are crowded together in close, ill-ventilated rooms.

When in such a state of concentration as not to pass the glottis, it produces instant suffocation, and if the person be not immediately removed from the noxious atmosphere, death ensues. But where it is diluted with atmospheric or other respirable air in sufficient quantity to be inhaled for a considerable time, symptoms closely resembling apoplexy are produced. This last casualty is most apt to occur from sleeping in a room with a charcoal fire, which has not a proper outlet for the gas, or in a green-house with plants, or even with a few flowers in a bed-room.

When from any of these causes an individual has fallen into a state of stupor or insensibility, he is to be removed as speedily as possible into the pure fresh air, cold water should be dashed upon the face, ammonia may be rubbed upon the chest, and, if conveniences exist, he may be caused to breathe oxygen gas. Blood, but in moderate quantity, should be attempted to be procured from the arm or jugular vein, and efforts to effect this may be persevered in for hours with ultimate success.

Carbonic acid diluted with a proper quantity of atmospheric air, has been advantageously employed, applied to limited portions of the body. Largely diluted, it has been recommended to be inhaled in the latter stages of phthisis pulmonalis, or consumption, to lessen the irritability, and remove the fœtor of the breath arising from the morbid expectoration. It is in such cases merely a palliative. When brought in contact with the mucous membrane of the stomach, it is often very serviceable; but if too strong, or its use is too long continued, it may give rise to alarming or unpleasant symptoms. The more speedy intoxication and headache which follow the use of the effervescing wines is due to the great quantity of carbonic acid gas which they contain. Even soda-water, if drunk in large quantity, may produce intoxication or headache. The usual form of administering carbonic acid gas is either in some of the natural mineral waters, such as Seltzer, or by disengaging it from its combination with some alkaline base, such as carbonate of soda or potash: any acid given at the same time, by combining with the alkali, will liberate the gas. A vegetable acid, either the citric, in the state of lemon-juice, or tartaric acid, is commonly employed for this purpose; but in many instances sulphuric acid is preferable. Whenever great debility, or the phosphatic diathesis, as indicated by the state of the urine, exists, the use of a vegetable acid for the object above mentioned is prejudicial. (Prout, *On Diseases of the Urinary Organs.*)

The gas thus disengaged is of great utility in allaying irritability and spasmodic states of the stomach; thus it frequently checks vomiting, either simple, or even of blood.

In the irritable state of the kidneys and bladder which prevails in a phosphatic condition of the urine, water charged with a large portion of carbonic acid gas (but without any alkali) is of double utility, both from its sedative effect and its chemical properties of dissolving and holding suspended the phosphate of lime, and preventing it being deposited in the bladder. Externally water charged with carbonic acid gas has been employed as a wash or bath in many cutaneous diseases with good effect. The yest poultice owes its soothing influence over irritable ulcers to the carbonic acid gas which is disengaged from it. A stream of carbonic acid gas has been proposed to be directed upon cancerous sores to allay the pain, and also upon burnt surfaces. But its employment in such cases requires caution.

CARBONIC OXIDE, commonly called also oxide of carbon, was first obtained by Dr. Priestley; but its nature and composition were determined by Mr. Cruikshank. Carbonic oxide may be prepared in various modes: first, by direct action; if charcoal be made red hot in a gun-barrel, and oxygen gas from bladders be repeatedly passed over it, the oxygen is converted into oxide of carbon. Dr. Priestley procured it by heating together chalk and iron filings; in this case the iron takes half the oxygen from the carbonic acid of the chalk, and from a compound of two equivalents of oxygen and one equivalent of carbon, the residual gas, which is carbonic oxide, is constituted of one equivalent of each.

Another mode of obtaining it, by which it is procured with the greatest facility, is to heat oxalic acid in a retort with sulphuric acid. Oxalic acid is a compound of three equivalents of oxygen and two of carbon: by the action of the sulphuric acid, it is separated into carbonic acid and carbonic oxide, which are both evolved in the gaseous state: the acid being soluble in water is dissolved, and the carbonic oxide remains nearly pure. The properties of this gas are, that it is colourless and insipid; it is but slightly dissolved by water: it is fatal to animals, and extinguishes a taper if immersed in it; but when it meets with oxygen gas it burns, and is converted, by combining with it, into carbonic acid. It has no action upon blue vegetable colours; and unlike carbonic acid also, it does not occasion any precipitation in lime water.

Carbonic oxide is composed of

1 equivalent of oxygen =
1 „ carbon =

equivalent = 14

It is hypothetically considered as constituted of 100 volumes of the vapour of carbon, and 50 volumes of oxygen gas, condensed into 100 volumes. One hundred cubic inches weigh 30·1 grains: its density is therefore to that of atmospheric air as ·971 to 1. When electric sparks are passed through carbonic acid gas, confined over mercury, a portion of it is converted into carbonic oxide and oxygen gases.

CARBURET, a term designating a compound of carbon with certain other bodies, as azote, and some of the metals, &c.

CARBURET OF AZOTE. [Cyanogen.]

CARBURET OF IRON. [Steel.]

CARBURETS OF HYDROGEN. [Hydrogen.]

CARCASS, a shell, or hollow ball of iron, perforated in three places at equal distances from each other, within one hemisphere of the shell, and filled with a composition which burns with violence during eight or ten minutes. When discharged from a mortar or howitzer the flames issuing from the perforations or fuze-holes set fire to any building on which the carcass may happen to fall.

For the dimensions of this kind of shell, and the nature of the composition, see Spearman's *British Gunner*

CARCASSONNE, or **CARCASSONE**, a city in the South of France, capital of the department of Aude, on the river which gives name to the department, in 43° 13′ N. lat. and 2° 22′ E. long., 387 miles in a direct line due S. from Paris, or 495 miles by the road through Orléans, Limoges, and Toulouse.

Carcassonne is a very antient place, having been built before the time of Cæsar, who speaks of it as one of the *civitates* or townships of Gallia Ulterior (taking that province in the limited extent which it had before he entered upon his command). What the town itself was at that time we have no information; the township is mentioned as having, in conjunction with Tolosa and Narbo (Toulouse and Narbonne), furnished several brave soldiers for the army of P. Crassus, Cæsar's lieutenant in his war with the Aquitani (Cæs. *de Bel. Gal.*, lib. iii., c. 20). Pliny and Ptolemy notice it as one of the towns of the Volcæ Tectosages; in the Itinerary from Burdigala (Bordeaux) to Hierusalem (Jerusalem) it is mentioned as *Castellum*, a military post, a designation which perhaps indicates decay from its former prosperity. Upon the downfal of the Roman empire, it passed successively into the hands of the Visigoths, the Saracens, and the Franks. Under the last it was for some time governed by counts of its own, who contrived to render their power hereditary. Its last count ceded his states to the then King of France, Louis IX., or Saint Louis, about the middle of the thirteenth century. Before this cession, the town had suffered severely in the wars against the Albigeois, or Albigenses, for whom it was held.

Carcassonne at present consists of two parts, separated by the river Aude, over which is a good bridge. The upper town or *cité* is on the right bank of the river, and is the most antient part. It is encircled by the old walls; its narrow and deserted streets and ill-built houses give to it a gloomy appearance. It has a castle, now in ruins (the erection of which is ascribed by some to the Visigoths), and the cathedral dedicated to St. Nazarius. This was erected about the end of the eleventh century; it is small, but handsome; the stained glass windows are admired for the beauty of the colours. The tomb of Simon de Montfort, the general of the crusade against the Albigeois, which was in this church, has been broken.

The lower town, on the left bank of the Aude, is regularly laid out with straight streets, crossing at right angles, and watered by streams of water from the river. The houses are well-built, and there are a great number of shops, many of which are handsome. The *Grande Place* is an oblong square, surrounded by regularly-built houses, and having in the middle a fountain, the design of which is sufficiently magnificent, but the execution poor; and the neglected and filthy state of which, when visited by M. Millin, formed a contrast with the general neatness and cleanliness of the city. The *Halles*, or covered market-places, are large and airy. The *Hôtel de Ville* is a building of good architecture, the theatre is handsome, the office of the prefect has magnificent gardens, and there are fine barracks and some other public buildings. The conventual buildings (we know not to what uses they have been applied since the suppression of monasteries) and the churches are also handsome.

By the census of 1832, Carcassonne had 14,872 inhabitants; the whole commune contained 17,394. The chief manufacture of the place is that of fine woollen cloths, which is carried on with great diligence. This manufacture existed here as early as the time of Louis XI. It was much increased by the patronage of Colbert, who established a manufactory in one of the suburbs of the town. The building still remains, but the establishment has been discontinued, and the manufacture is now in the hands of private capitalists. The wool is chiefly brought from Spain or from Narbonne, or Beziers; it is carded, spun, and woven in the town, and the cloths are sent to the Levant. The trade of Carcassonne is much promoted by a navigable branch from the great canal of Languedoc, or *du Midi*. Wine, brandy, and fruit are among the other chief articles of trade. Some marble quarries are wrought in the neighbourhood of the town: the marble is of various colours; that veined with red is particularly beautiful. The quay is adorned with handsome promenades, and presents a constant scene of activity. There are at Carcassonne two libraries, a high school, and a museum.

The episcopal see of this town cannot be traced higher than the sixth century with any certainty; the assertions that there were bishops here about the end of the third or the beginning of the fourth century is very disputable. The diocese comprehends now the department of Aude, and the bishop is a suffragan of the Archbishop of Toulouse and Narbonne. The arrondissement of Carcassonne comprehends a population of 90,658 persons.

The district of which Carcassonne was formerly the capital took from the town the designation Carcassez. Notwithstanding the heat of the climate, and the consequent desirableness of shade, there are few trees except along the banks of the canal of Languedoc; the inhabitants allege the value of the land as a reason for their unwillingness to plant trees, or even allow them to remain. Fabre d'Eglantine, member of the convention, guillotined at Paris in 1793, was a native of this town.

In the neighbourhood of the town is the relic of a column of greyish stone, bearing an inscription to M. Numerius Numerianus Cæsar; but as the whole of the inscription has not been certainly interpreted, it is not known by whom or on what occasion it was erected. There is also a remarkable aqueduct-bridge of three arches, by which the Canal de Languedoc is carried over the river Fresquel, which runs to Castelnaudary. M. Malte Brun seems to have confounded these two structures, making of them a triumphal arch on the banks of the Fresquel to the honour of the Emperor Numerian.

CARCHA'RIAS, a genus of fishes of the shark tribe. [Squalidæ.]

CARCINUS. [Crab.]

CARDAMOMS, the aromatic capsules of different species of Amomum. The sorts known in the shops of

Europe are the large, the middle-sized, and small, the clustered or Malabar cardamoms, and the grains of paradise, or Mellagetta or Malagueta pepper.

Large cardamoms are supposed to be the seeds of *Amomum angustifolium*, a Madagascar plant, with a remarkably strong, but pleasant and aromatic odour.

Middle-sized and small cardamoms are believed by Fée to be both produced by *Amomum cardamomum*, a native of Sumatra, and other islands to the eastward of the Bay of Bengal.

Malabar cardamoms, which are the best sort, and those in the most extensive use, are produced by *Amomum repens*, the *Elettaria* of Maton, and the *Alpinia cardamomum* of Roxburgh. This is a native of the mountainous part of the coast of Malabar, especially among the western mountains of Wynaad, where it is called by the natives the *Ailum* shrub. For its cultivation, see Roxburgh's *Flora Indica*, vol. i., p. 72; and the *Transactions of the Linnæan Society*. It is believed to be the amomum of Theophrastus, and constitutes at the present day the most esteemed of the condiments employed by the Turks, Persians, and other eastern nations, entering into all their sauces, pillaus, curries, &c.

Grains of paradise, called also Mellagetta or Malagueta pepper, are the fruit of *Amomum granum paradisi*, a native of Ceylon and Madagascar. Its qualities are similar to those of ordinary cardamoms, but inferior. It is probable that the seeds of some other species of amomum would also serve as substitutes for cardamoms, but they have not been much inquired into. *Amomum aromaticum* is mentioned by Roxburgh as being so employed by the natives of the eastern frontier of Bengal; *Amomum maximum* also yields a coarse description of the drug.

CARDAN, JEROME. To give any great detail of the life and writings of this singular union of genius and folly would require considerable space. We must therefore confine ourselves for the most part to those circumstances in regard to which his name is principally mentioned in modern writings.

On the life of Cardan the authorities most in use are—1. His own treatise *De Vitâ Propriâ*. Works, vol. i.—2. G. Naudæus 'Judicium de Cardano,' 1643. The most accessible accounts of these are in 'Bayle's Dictionary,' article 'Cardan;' and in Teissier, 'Eloges des Hommes Savans,' vol. iv. p. 97.

The works of Cardan were collected under the title of 'Hieronymi Cardani Opera omnia, curâ Caroli Sponii,' Lyons, 1663, in ten volumes, folio. The following list of works, long as it may appear, is perhaps the shortest mode of touching on many points which require only the briefest notice. In all, the date *begins* the title.

1539. Card. Cassilionei Practica Arithmetica, &c. Milan.—1541. Aphorismi astronomici. Ulm.—1542. De Consolatione. Venice.—1544. De Judiciis Geniturarum exemplis illustratum. Nuremburg.—1545. Ars Magna, &c. Nuremburg.—1545. De Malo recent. Medic. medendi usu. Venice.—1545. De Animi Immortalitate. Venice.—1547. De Supplemento Almanach. Nuremburg.—1547. De Genituris, Revolutionibus, &c. Nuremburg.—1550. De Rerum Subtilitate. Nuremburg, (again in 1557.)—1553. An Baln. Articulari Morbo competat. Venice.—1454. In quadripart. Cl. Ptolemæi. Ejusdem Geniturarum xii. Basle.—1557. De Rerum Varietate, lib. xvii., folio. Basle.—1559. In Hippocratem de Aere, &c. Oratio de Medic. Inscitiâ. Basle.—1559. Opusc. Artem Med. exercent. utilissima. Basle.—1561. De Utilitate ex Rebus Adversis capiendâ. Basle.—1562. H. Card. Somniorum Synesiorum, libri iv. Basle.—1563. De Providentiâ ex Anni Constitutione. Bologna.—1564. Comm. in vii. Particulas Aphorism. Hippocratis. Basle.—1564. Ars Curandi parva. Basle.—1565. De Simpl. Medicament. Noxâ. Paris.—1565. De Methodo Medendi. Paris.—1566. Anti-Gorgias. Basle.—1570. H. Card. &c. de Proportionibus Numerorum, Motuum, &c. . . . Preterea Artis Magnæ sive de regulis Algebræ, liber unus, &c. . . . Item, de Alizâ Regulâ liber. Basle.—1578. Examen 22 Aegrotorum Hippocratis. Rome.

We have chosen this list as containing all we can certainly ascertain to have been published during his lifetime. We have found the dates mostly in old catalogues, and it is very possible that several may be reprints. The list of his works is of considerable length, but many were not published until after his death; and some not till the collection in ten volumes, already mentioned, was. He states of himself that he had printed 126 books, had written 40 more, and that 60 authors had cited him.

Jerome Cardan was born at Pavia in the autumn of 1501: his father was a physician and lawyer at Milan. From two circumstances mentioned by himself, namely, that his mother and father did not live together, and also that the former endeavoured to procure a miscarriage, it is presumed that he was illegitimate. At twenty years of age he studied in the university of Pavia; at twenty-two he taught Euclid in the same place. He went to Padua in 1524, and was there received doctor in medicine in 1525. He was successively professor of mathematics or of medicine at Milan, Pavia, and Bologna, and was imprisoned in the latter place (but for what offence is not stated) in 1570. Having obtained his liberty, he left Bologna in September, 1571, and went to Rome, where he was admitted into the college of physicians, and received a pension from pope Pius V. He died after Oct. 1, 1576, and probably not long after, but when is not well known. He was unfortunate in his family, which consisted of two sons and a daughter. The elder poisoned his wife, and died by the hands of the law; Cardan protested against the sentence, and rested his son's justification upon the conduct of the wife, who, he affirms, had made his son believe she was a woman of good fame and fortune, being neither. It is an evidence of the extreme vanity of his character, that, not denying the fact for which his son suffered, he left on record his belief that the judges, in passing the sentence, had no other object than to deprive him of life or reason. The younger son turned out badly, and was disinherited by his father. His daughter, according to his own account, never caused him any other vexation than the payment of her marriage portion. The treatise 'De Utilitate,' &c. was written on the death of his eldest son.

If Cardan had left nothing but writings on astrology, mathematics, medicine, or morals, he would have passed among the rest as an eccentric genius, with a full share of all the folly and mysticism which pervaded the philosophy of his day. It is to his own account of himself that we are indebted for the quantity of description and speculation relative to his personal character which is found in all biographies. There may be in this production a touch of the insanity which delights in accusing itself of crimes, or in exaggerating its foibles: as it is, and taking the character of Cardan as he has given it himself, we see a man—of unequalled self-conceit, as when he says his book of logic (written in seven days, but hardly to be understood by any one else in a year) has not a letter either of omission or superfluity; and that he is born to deliver the world from a multitude of errors: of little benevolence, as when he avows that his greatest delight in conversation is to say things which he knows will be disagreeable to his hearers: of no veracity, as witness his assertion that he acquired a perfect knowledge of Greek, Latin, French, and Spanish in twenty-four hours from an edition of Apuleius: of violent temper, instanced by his striking one in the face with a dagger whom he discovered to be cheating him at play; and of little honesty, as evidenced by his justification of his refusal to return a pledge, namely, that it was deposited in presence of no witness. He was also a superstitious freethinker; attached to his religion, but disposed to treat it in his own way, to an extent which made a worthy divine who claimed, we suppose, to be the adjutant-general of heretics, call him the 'chief of the hidden Atheists of the second class.' His refusal to accept an advantageous settlement in Denmark, on condition of apostatizing, ought to establish his right to some principle. His four gifts—1. the power of throwing his soul out of his body (for his words can mean nothing less)—2. his faculty of seeing whatever he pleased *with his eyes*, 'oculis, non vi mentis'—3. his dreams, which uniformly and on every occasion foretold what was to happen to him; and—4. his finger nails, which did the same thing; to say nothing of his astrology, his good demon, &c. &c.—establish his claim to be the chief of the visionaries 'of the first class.' Bayle has drawn the distinction between him and other men of equal talent with some point: he says that 'nullum magnum ingenium sine mixturâ dementiæ' is not a maxim which includes Cardan; for that with him the folly is improved by talent, not the talent adulterated by folly.

It would hardly have been worth while to have entered into the preceding detail, if Cardan had been a common man. As a physician his reputation extended through Europe, both as a practitioner and a writer. In 1552 he went to Scotland to the assistance of Hamilton, archbishop of St. Andrew's, whom he cured: in the memoirs of Melvil the fact is stated, and Cardan is mentioned by name, with the addition that he was an Italian magician. His medical writings have procured him no lasting reputation: those who follow such pursuits seem to have tacitly consented that Cardan shall be left to the mathematicians; and it is to his discoveries in algebra that he must be considered as entitled to a prominent place in biography. Before proceeding to consider him in this character, we shall only state that De Thou, who knew him personally, and records that he always dressed in a different manner from the rest of the world, says that it was commonly believed his end arose from starvation, voluntarily undergone, that he might not outlive the time which he had predicted for his own death. This story has been frequently copied, as if the fact had been positively asserted by the historian, whereas he only speaks of a rumour.

The *Ars Magna*, published in 1545, contains the extensions which Cardan made in the solution of equations. Algebra was then an art contained not in formulæ but in rules, and extended no farther than the methods of solving numerical equations of the second degree. We shall not here enter into the celebrated dispute between Cardan and Tartaglia, further than to specify the part taken by the former. When he was informed of the solution of cubic equations, which Tartaglia had discovered, he applied to the latter, March 25, 1539, and requested he would communicate his method, which Tartaglia declined, intending to reserve the same for the work which he published afterwards in 1554. Cardan then swore 'upon the Holy Gospels, and the faith of a gentleman,' that he would not only not divulge the secret, but would engage to write it in such a cipher as no one should be able to read, in case of his death. Tartaglia, upon this assurance, communicated his method. This detail rests upon the authority of Tartaglia himself (*Quesiti et Inventioni*, folio 120), but is amply confirmed by Cardan's subsequent letters, and was never denied by him. Notwithstanding his word thus pledged, Cardan published these methods in his *Ars Magna* (1545), giving the credit of them, indeed, to Tartaglia, but concealing the promise he had made.

The communication made to Cardan amounted to the solution, without demonstration, of $x^3 + ax + b = 0$, in the cases where a and b are, one or both, negative. Cardan himself supplied the demonstrations, showed how to reduce all equations of the third degree to the preceding form, and how to extract the cube root of the binomial surd quantities which the well known solution involves. He may be said to have arrived, in detached and isolated theorems, at as much, relative to equations of the third degree, as could afterwards be established, in the time of Des Cartes, for equations of all degrees. He was the first who considered negative roots, and comprehended the nature of the connexion between them and the positive roots of other equations; and he even gave the first idea of a method of approximation.

The algebra of Cardan, owing to the want of general symbols, is difficult to read; and Montucla, biassed perhaps in favour of his countryman Vieta, has somewhat underrated his merits. On the other hand we have Cossali (*Origine, &c. dell' Algebra*, Parma, 1797), whose object it seems to be to discover something like modern and symbolic analysis in the obscure and verbal rules of the Italians of the sixteenth century. If this learned and estimable writer be considered as holding a brief for Tartaglia, Cardan, and Bombelli, his work may be highly useful. For instance, when he shows, by collecting the various cases propounded by Cardan, that the latter had all the elements, which, if put together, would have been the celebrated rule of signs of Descartes, and thence affirms that Cardan was in possession of that rule so far as equations of the third degree were concerned, he forgets that Cardan neither did nor could put those elements together. And when he attributes a symbolic (or as it was technically called, a specious) notation to Cardan, because the latter sometimes uses a letter to stand for a number in his general enunciations, he does not remember that Euclid has a prior claim, if in that circumstance merely, consists the leading feature of the method of Vieta.

There is in the algebra of Cardan considerable power of developing the details of his subject, and of explaining the modifications presented by solutions, but not much inventive sagacity. He states himself, that he was originally prevented from attempting the solution of cubic equations by the simple assertion of Lucas di Borgo, in his work on algebra, that the solution was impossible; though Cossali has shown that, had he even read that author with attention, he would have seen that the assertion was not meant to apply to more than algebra as it then existed. In the case of biquadratic equations, he attempted nothing himself, but requested his pupil, Ludovico Ferrari, to undertake the investigation; who accordingly produced the reduction now known by his name, and which was published by Cardan. But if we take the whole extent of the *Ars Magna*, it is sufficiently obvious that Cardan would have been an analyst of considerable power, if he had lived after Vieta.

There is in the second volume of Dr. Hutton's *Tracts* an account of the *Ars Magna*, the most complete of which we know in English.

CARDIGAN, a sea-port and borough town, the capital of Cardiganshire, is about 200 miles direct distance W.N.W. of London, and 234 miles by the roads. It is called Aberteify by the Welsh, from its standing upon the banks of the river Teify, about three miles from its mouth. Cardigan, in conjunction with Aberystwith, Lampeter, and Adpar, returns one member to parliament. Adpar, a small village once disfranchised, has been restored as a contributory borough. The limits of the borough of Cardigan, formerly co-extensive with the parish of St. Mary, were extended by the Reform Act: they now include the whole of the old borough, together with Bridgend Hamlet and Abbey Hamlet, in the parish of St. Dogmaels in Pembrokeshire. By the same act the limits of the other contributory boroughs were enlarged. In a charter granted to Cardigan by Henry VI. several previous grants and charters are recited, the oldest of which is in the reign of Richard II. Cardigan first rose into a town about the time of the Norman conquest. The foundation of its castle is ascribed to Gilbert de Clare, about 1160. The first fortifications lasted only a short time, as the continual struggles between the Welsh and their Norman invaders for the possession of this post, which the mouth of the river rendered important, and the various success that attended the contest [CARDIGANSHIRE] caused the frequent damage or destruction of the castle, which was however always restored by the victors soon after they had obtained possession of it. The two towers and the wall now standing, are probably the remains of the fortifications erected by Gilbert Marshall, about the year 1240. Edward I. resided here for a month while settling the affairs of South Wales.

The castle stands in a commanding position above the river, which is here crossed by an antient bridge. Giraldus Cambrensis states the Teify to have been the last British river in which beavers were to be found. There was a priory here, which is stated by Leland to have contained eleven black monks, and to have been a cell to Chertsey. A small but strong camp, called Hên Castel, is situated on the banks of the Teify, a little below the town. The local government is administered by four aldermen, one of whom is mayor, two bailiffs, and twelve common councilmen. All the streets are narrow excepting one, the principal thoroughfare of the town, at the end of which stands the county gaol, which was erected by Mr. Nash in 1793. A handsome county hall was built here in 1764. The church, whose tower at the west end is of more modern date than the chancel, is dedicated to St. Mary. The supply of water in this town was extremely deficient, until a reservoir was built by subscription in the upper part of the town, from which the requisite pipes have been laid. Coal is imported coastwise, and peat is used by the lower classes of inhabitants.

Cardigan contains the chief custom-house for the port of Cardigan, which extends four to five miles beyond Fishguard on the S., and about twenty-four miles to the N., so as to include Aberayron. The harbour is greatly obstructed by a bar, and is dangerous in winter. Ships of 300 to 400 tons can come up to the bridge in spring tides; but the general trade is confined to vessels of from 20 to 100 tons. The registry of vessels in this port is considerable. At present (1836) there are 280 ships of every description, from 20 to 270 tons, their average being about 60 tons; these are employed in the Irish, foreign, and coasting trade. The imports are chiefly coal, culm, limestone and deals; the exports, oats, butter, and slates. No manufacture of any importance is carried on here. The population in 1831 was 1149 males; 1646 females; total 2795; 213 families employed in trade and handicraft; 20 families employed in agriculture.

The number of inhabited houses was 560; the town seems to be [illegible] below the annual value [illegible]

with 21*l.* 10*s.* 6*d.*, in 17[illegible], by Lady [illegible]

Aber Marles; it now contains about thirty children. Th [illegible] is a national school, with about eighty scholars; a girls' charity-school, supported by voluntary contributions, contains near fifty, and commercial schools about sixty pupils. [illegible] a small sum, are aided

[illegible] which [illegible] intermixed, amounted to 226*l.* 12*s.* The poor's expenses of the year ending Easter, 1835, were 904*l.* 8*s.* 9*d.*

CARDIGANSHIRE, a maritime county of South Wales, bounded on the N. by the counties of Merioneth and Montgomery, on the E. by Radnorshire and Brecknockshire, which are for the most part separated from it by the rivers Claerwen and Towy, on the S. by Pembrokeshire and Carmarthenshire, from which in three-fourths of its length it is divided by the river Teify, and in part by a stream called the Dothie. The Irish sea forms its boundary on the W. Its greatest length from N.E. to S.W. is about forty-six, and greatest breadth from E. to W. near thirty-five miles. The length of sea-coast is about forty-two miles. The area is 675 square miles. In 1831 its population was 64,780, being an increase of 21,824, or about one in three during the thirty previous years.

The S.W. district of Cardiganshire is level, as also is the neighbourhood of Aberayron, and several other tracts near the coast; in general, however, the surface is mountainous, especially in the northern and eastern parts. The highest lands are rugged, bleak, and barren; covered with ling, rushes, and heather, where the peat is not too wet, or the ground too stony to suffer them to grow: those that are somewhat lower afford pasture for the little hardy sheep of the country, the property of the small farmers, whose dwellings are, for the sake of shelter, placed in the narrow valleys beneath. The proportion of uninclosed to inclosed lands is very large. An anecdote related by Mr Malkin in his account of Cardiganshire is an apt illustration of the condition of its surface. "An auctioneer who was endeavouring to sell a considerable estate, after having explained the value, &c., of the property, thus addressed the company:—"And, gentlemen, there are 10,000 acres not mentioned in the particulars of the estate, which will be thrown into the bargain to the purchaser." It has been calculated that the area of the inclosed lands does not exceed that of the uninclosed by more than 25,000 acres.

A part of Plinlimmon is situated in the N.E. part of the county; this mountain and Tregaron Down, Talsarn, and Capel Cynon are the most elevated summits in Cardiganshire. Their heights are—Plinlimmon, 2463 feet; Talsarn, 1143; Tregaron Down, 1747; Capel Cynon, 1046. The sea-coast, in its N. and S. extremities, is flat and sandy; towards the centre of its line the hills terminate abruptly, and the beach, from which, on account of its shelving rapidly, the sea retreats but little at low tide, is chiefly formed of shingle. The principal rivers are the Teify, which rises in Llyn Teify, a small lake on the eastern border, and abounds with salmon, of which a large quantity is carried to distant markets; the Towy, the Claerwen, the Ystwith, and the Rhydol, which rises in Plinlimmon. The two latter fall into the sea at Aberystwith. The Arth, the Ayron, the Wirrai, and the Lery are also considerable streams. The roads (which carry the whole traffic of the county, for there is neither canal nor rail-road in this district) have of late years been much improved. An entirely new line of communication with Radnorshire, which in part of its length is used by travellers to Llanidloes and Newtown, has been of great benefit to Aberystwith. A mail was established in 1835 from Aberystwith along this road to Rhayader, and thence to Hereford and Cheltenham, which has accelerated the delivery of London letters in a large part of Cardiganshire nearly twelve hours. The other principal roads lead from Aberystwith to Machynlleth, from the same place to Cardigan and Lampeter, and that from Tregaron through Lampeter and Newcastle Emlyn to Cardigan. At a few miles N.E. of Tregaron are situated several small mountain-lakes, which are abundantly stored with fish. The chief are Llyn Teify, Llyn Gynon, Llyn Egnant, and Llyn-ruddonevawr; these have much wild beauty, which is however far exceeded by the celebrated water-falls of the Mynach at the Devil's-bridge, the falls of the Rhydol at Havod, and the rapids higher up that stream, in the neighbourhood of Pont Erwydd. The climate of this county is in winter very rough, the winds are violent, and the snow frequently remains on the mountains till late in the spring; in summer however and in autumn there is a light dry wholesome air, which is extremely pleasant.

The county of Cardigan chiefly consists of hard slaty strata, belonging to the transition series, and destitute of organic remains. They lie immediately under the lowest member of the Silurian system, recently described by Mr. Murchison as occupying the neighbouring counties. No coal is known to exist in this district, nor can it be expected that any will ever be found in strata belonging to so early a geological period; neither is any limestone found within the county.

The soil of this county is for the most part unfavourable to cultivation; in the mountainous districts it is thin and cold, and yields a small produce of oats, barley, and potatoes; rye is also sown in small quantities. Near the sea-coast, especially on the flat loamy tract between Aberayron and Llanrysted, wheat is cultivated successfully; large crops of barley are raised on lands manured with sea-weed, and potatoes are grown in abundance.

The system of husbandry, as well as the rude implements that are used, admit of considerable improvement.

The prevailing breed of cattle is small and hardy, in colour for the most part black or brindled; dairy-farming is not uncommon, and butter is made in considerable quantities. The horses are small but compact, and though frequently supplied with only scanty fare, are capable of drawing considerable weights in one-horse carts, which throughout the county are in general use, waggons being seldom if ever seen. The sheep are neither well-formed nor fine in the fleece; but their endurance and constitution adapt them admirably to the exposed hills on which they pasture, and from which they are seldom driven down, the ewes in the yeaning season excepted. They do not fatten readily, and are so small as frequently not to weigh more than 10 lbs. a quarter: the mutton is excellent both in grain and flavour. A considerable quantity of pigs and poultry is reared, and eggs in great numbers are collected from the cottages and farm-houses, by persons who convey them weekly to distant markets.

The farms are let on a yearly tenure, at from 1*l.* 10*s.* to 3*l.* an acre near the principal towns, about 1*l.* 1*s.* on many parts of the coast, and from 6*s.* to 15*s.* in the more mountainous parts. With nearly all farms is let a right of pasturage on the hills for a given number of sheep, which often forms the principal source of profit. Their size varies from 40 to 150 acres; in the best districts some are yet larger. The farmers too frequently rent more land than their capital enables them to cultivate properly, and it is not unusual for them to exhaust the land and employ insufficient labour. The fences are frequently made with alternate layers of turf and stones, built up as walls, without bushes growing upon them. The cottages are generally very bad; it is usual to whitewash their roofs as well as the walls.

Cardiganshire is divided into five hundreds—Genewr Glynn, Ilar, Moyddyn, Penarth, and Troedyraur. Cardigan Island, an extra-parochial tract of pasturage of about forty acres extent, situated at a short distance from the mainland, at the mouth of the Teify, forms a part of Troedyraur hundred.

There is an accepted tradition that there was formerly, in addition to these five hundreds, a sixth, called Gwaelod, or 'the Low Land,' which has been encroached upon by the sea. Portions of trees are found at a considerable distance from the shore, a fact which, combined with the circumstance that the rocks run in a serpentine direction about twenty-two miles from the Merionethshire coast, between Harlech and Barmouth, tends to confirm the above opinion. These hundreds are divided into sixty-eight parishes, which contain five market-towns—Aberystwith, a seaport in Genewr Glyn hundred; Lampeter, in Moyddyn; Cardigan and Newcastle-Emlyn, in Troedyraur; and Tregaron, in Penarth. Of these Cardigan and Newcastle-Emlyn are on the river Teify, and Tregaron and Lampeter within a short distance of its banks. Cardigan, Lampeter, Aberystwith, and Adpar are corporate towns. Next in size to the market-towns are the villages of Llanbadarn-Fawr, Llanarth, Llanrysted, Aberporth, and Abera[illegible] he benefices th[illegible]out the county are of very small value; nearly all are below 200*l.* a year, and a large proportion below 100*l.* The chief residences are Havod, belonging to the Duke of Newcastle; Goggerddan, Nanteos, and Crosswood, the property of Lord Lisburn.

The mines, which in former times were both extensively and profitably worked, are now of comparatively small value. At Talybont the ore is nearly exhausted; at Cwmystwith the lead mines are not productive, and the copper ores have ceased altogether to be worked. Four persons only are enumerated as smelters in the population returns of 1831. There are several slate quarries in the neighbourhood of Aberystwith, but the slate is not of good quality. As there is no coal in the county, peat, being abundant, is the fuel chiefly consumed. The manufactures of this district are unimportant, being confined to the weaving of a small quantity of flannel and coarse woollen stuffs. Gloves are also made in the neighbourhood of Aberystwith and Tregaron. Oats, butter, and slates are exported. The decks of some of the vessels engaged during the summer in bringing lime or limestone from Pembrokeshire, or otherwise in the coasting trade, are taken off in autumn, and they are used as fishing-boats. The principal imports are coal from Liverpool, culm from South Wales, Pembroke limestone, and Memel and American deals. The harbours are extremely exposed, and the bars at Cardigan and Aberystwith are great impediments to navigation. The supply of fish is variable, for except in fair weather the boats do not venture out to sea.

Cardiganshire is wholly in the province of Canterbury and diocese of St. David's. One member is returned to parliament for the county, another for the contributory boroughs. The assizes are held at Cardigan, where the judge named for the South Welsh circuit comes the third in rotation on his way from Pembroke to Carmarthen. The county polling places are Cardigan, Lampeter, Aberystwith, and Tregaron. The Easter quarter-sessions are held at Lampeter, at other times at Cardigan or Aberystwith.

The name Cardigan is derived from 'Caredigion,' which signifies the territory of Caredig, the first king of this district, who was succeeded by a long line of princes of whom little is known until the reign of Rodri Mawr, or Roderick the Great, who in the year 843 became by inheritance and marriage the king of all Wales. At his death Roderick divided his dominions into three parts, in each of which he had built a palace, and bequeathing to each of his sons a share, appointed the third prince umpire over the quarrels of any other two. Cardiganshire became the property of Cadell, who shortly after his father's death seized upon his brother Merfyn's portion, which caused the eldest brother, Anarawd, to lay waste the county of Cardigan. Cadell died in 900. After [illegible]is time Cardigan became a lordship under the princes of South Wales. Gwaethvoed Vawr, its first lord, was succeeded in 950 by his son Cedivor. In 952 Cardiganshire was again laid waste by two North Welsh princes, w[illegible] claimed it as their possession. Cedivor was probabl[illegible]tatary to Owain, son of Howell Dda, who became governor of Cardiganshire at his father's death. The lords of Cardigan cannot be traced regularly after this period. In 986 Meredyth usurped the territory, but in 987 was much harassed by the Danes, who destroyed St. David's, Llanbadarn, Llanrysted, and several other religious places. Edwin, the lawful heir, in 989 procured an army of English and Danes, and obliged the inhabitants to own him their sovereign. In 1038 Gryffydd, prince of North Wales, came into Cardiganshire, burnt Llanbadarn Vawr, and afterwards compelled all South Wales to swear allegiance to him. In 1071 Cardiganshire was again plundered by the Danes. About 1092 the Normans landed here, and Roger Montgomery, earl of Arundel, did homage to William Rufus for the lordships of Cardigan and Powis; but when King William returned to Normandy, the Welsh, commanded by the princes both of North and South Wales, entered Cardiganshire, and destroyed the Normans, their castles, and fortifications. In 1097 Cadwgan, who had been deprived of his possessions in South Wales, regained Cardiganshire, with part of Powis. Upon a dispute with Cadwgan Henry I. gave permission to Gilbert Strongbow, earl of Strygull, to seize his territories. Gilbert raised a strong force, soon reduced Cardiganshire, and built the castles of Aberystwith and Cilgerran. In 1114 Gruffydd, the son of Rhys ap Tewdor, having gained many victories over the Normans, the inhabitants of Cardiganshire, fearing that his next expedition might be agai[illegible] offered [illegible] the government of their country; this [illegible] accepted by G[illegible]ffydd, who with his whole army was soon after cut to pi[illegible] by Gilbert Strongbow and the Normans. To [illegible] joy of the Welsh, Gilbert did not long survive him. In 1135 Cadwalader and Owen Gwynedd, the sons of the prince of North Wales, with 6000 foot and 2000 horse, being joined by two chieftains from the South, determined to extirpate the Normans. They overran the country as far as Cardigan, and were victorious in an engagement with Stephen, the governor of the place, whose army, composed of Normans, Flemings, and English, lost more than 3000 men. About the year 1137 Owen Gwynedd a second time invaded Cardiganshire, which it seems then belonged to his brother Cadwalader. He entered it a third time, and burnt Aberystwith Castle in 1142. There were repeated engagements between the Welsh and Normans in 1144; and in 1148 Cadwalader built a castle at Llanrysted, which afterwards sustained an obstinate siege. The disturbances among the Welsh continued with little intermission until 1171, when King Henry II. gave Cardiganshire with other territories to Prince Rhys, the last prince of this district. In 1176 Rhys gave a great entertainment at Christmas in his castle of Cardigan; several hundreds of English, Normans, and others were there. All the bards of Wales were present, answering each other in rhyme. Gruffydd Rhys's son became lord of this county in 1196; he was soon involved in a dispute with his brother Maelgwyn, who seized his territory, and threw him into prison. In 1207 this cruel usurper, fearing an attack from Llewelyn ap Jorwerth, prince of North Wales, demolished his castles of Aberystwith, Ystradmeyric, and Dinerth; nevertheless Llewelyn entered Cardiganshire, and having rebuilt Aberystwith Castle gave it to Rhys and Owen, the sons of Gruffydd ap Rhys, and nephews of Maelgwyn. Maelgwyn swore allegiance to the English, and procuring by these base means a large army of English and Normans, gave battle to his nephews, but was conquered and slain. King John having already subdued the rest of Wales, compelled Rhys and Owen to give up their lands, and do homage to him; he also fortified and garrisoned Aberystwith Castle, but did not long retain his possession. In 1215 Llewelyn entered Cardiganshire and took Cardigan Castle, and in the following year portioned out and gave South Wales to different chieftains, who acknowledged his superiority. Llewelyn afterwards seized Aberystwith Castle in addition to that of Cardigan, where he sustained sieges from, and in his turn besieged, the English, who having obtained possession were in 1231 conquered by Maelgwyn the younger.

In 1238 Llewelyn summoned all the Welsh lords and barons to Ystradflur, where each swore fealty to him, and did homage to his son David, whom he named his successor. But David was not to enjoy tranquillity; Gilbert Marshall, earl of Pembroke, besieged, took, and garrisoned the castle of Cardigan. In 1270 Madoc did homage to Llewelyn ap Gruffydd as lord of Cardigan, agreeably to the charter granted by the king of England, which confirmed to Llewelyn the title of Prince of Wales. King Edward I., in 1277, obtained great advantages over Llewelyn, and dictated hard conditions of peace, to enforce which he built and garrisoned a castle at Aberystwith. Edward now divided Wales into counties, and annexed it to England in 1284; and the better to settle his affairs, soon afterwards made a progress through Cardiganshire, the history of which must from this time be considered in connexion with that of England. We will only mention that, in 1404, Owen Glendwr took Aberystwith castle, which was recovered by Prince Henry in 1407. The earl of Richmond (afterwards Henry VII.) passed through Cardiganshire in his way from Milford to Bosworth field in 1485. A curious privilege was granted by Charles I. to Mr. Bushel, then proprietor of many mines in Cardiganshire—*the permission to coin the metal that he raised*. A mint was established by him in Aberystwith castle, and afterwards removed to Shrewsbury. The money coined by him, of which some has within a few years been dug up at Aberystwith, was distinguished by a plume of feathers on the reverse.

Cardiganshire abounds with antiquities. There are, besides many Druidical remains, a Roman station at Llanio, and a Roman road traversing the county in a N. and S.

direction from that place. Remains of castles are either standing, or it is evident that such fortifications have existed at Cardigan, Aberystwith, Lampeter, Ystradmeyric, Cilcennin, Llanrystud, Dinerth, Moyddyn, Abereinon, Penwedic, Castell Gwalter, Castell Cadwyan, Hên Castell, Castell Flemis, &c. There were also religious houses at Cardigan, Lampeter, Llanrystud, Llandewi-Brevi, and Strata Florida. The abbey last mentioned, of which a fine Saxon arch and some walls now stand, is situated about five miles from Tregaron. It was the depository of part of the records of the principality, and the burial-place of many Welsh princes and celebrated bards. Rhys Gruffydd founded the first abbey in 1164; this building however was destroyed, and a new one erected two miles distant from the original site. We also find that Edward I. granted 78*l.* to the abbey of Strata Florida for damages sustained during the 'late war and conflagration.'

In 1822 a college for the education of the Welsh clergy was founded at Lampeter: this institution, which at a cheap rate affords far better instruction than the old collegiate schools, is of great public utility. The students reside within the college, which is well conducted by a principal, a vice-principal, and professors of Greek, Hebrew, Welsh, divinity, &c. The bishop of the diocese, who is visitor, ordains no one who has not graduated at Oxford, Cambridge, or Lampeter.

Statistics.—Population. Cardiganshire has no manufacture of any importance. According to the census of 1831 it appears that of 14,598 males twenty years old and upwards residing in this county 8686 were engaged in agriculture, and 248 in manufactures or in making manufacturing machinery. Of the latter number about 240 were employed in weaving flannel and other light woollen goods, the yarn for the purpose being spun by cottagers residing in the county.

The following summary of the population for May, 1831, shows the number of inhabitants and their occupations in each hundred of the county.

HUNDREDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not included in the two preceding classes.	Males.	Females.	Total of persons.	
Genewr-Glyn . .	2,377	2,702	21	114	1012	775	915	5,896	6,696	12,592	2,810
Ilar (lower division)	1,675	1,692	22	33	880	448	364	3,896	4,151	8,047	1,862
Ilar (upper division)	1,511	1,549	14	29	896	317	306	3,836	4,012	7,848	1,814
Moyddyn . . .	3,128	3,150	26	80	1968	614	548	7,213	7,767	14,980	3,369
Penarth	1,323	1,356	4	18	918	289	149	3,132	3,332	6,464	1,510
Troedyraur . . .	2,471	2,515	18	42	1562	527	426	5,746	6,308	12,054	2,687
Cardigan (borough) .	560	688	10	6	20	213	455	1,149	1,646	2,795	546
Totals .	13,045	13,652	115	324	7246	3243	3163	30,868	33,912	64,780	14,598

The population of Cardiganshire at each time of the census being taken in this century was:—

	Males.	Females.	Total.	Inc. per Cent.
1801 .	. .	. .	42,956	
1811 .	. .	. .	50,260	17
1821 .	27,898	29,886	57,784	14·97
1831 .	30,868	33,912	64,780	12·10

Showing an increase between the first and last periods of 21,824 persons, or little more than 50¾ per cent., which is below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the three periods of

1811 were	£ 12,386	equal to	4*s.* 11*d.*	for each inhabitant.
1821 ,,	14,886	,,	5*s.* 1*d.*	
1831 ,,	17,591	,,	5*s.* 5*d.*	

The expenses for the same purpose in the year ending 25th March, 1834, was 18,624*l.* 18*s.*; and assuming that the population has increased for the last three years in the same uniform ratio as during the ten preceding years, the above sum averages 5*s.* 2½*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in this county for poors' rate, county rate, and other local purposes, in the year ending 25th March, 1833, was 23,242*l.* 11*s.*; of which was expended—

	£.	*s.*
For the relief of the poor . . .	18,821	7
For suits of law, removal of paupers, &c.	745	19
For other purposes	3,637	5
	£ 23,204	11

The descriptions of property assessed for local purposes are not distinguished in the returns made up for the year ending March, 1834. The total amount levied in that year was 22,685*l.* 17*s.*, and the expenditure was as follows:—

	£.	*s.*
For the relief of the poor . .	18,624	18
In suits of law, removal of paupers, &c.	687	7
For other purposes . . .	3,136	5
Total	£ 22,448	10

There has therefore been a saving in the expenditure for the relief of the poor in 1834, as compared with the preceding year, of not 1 per cent. The other expenses were however less in 1834, and consequently the whole amount of saving is raised to about 3½ per cent.

The number of turnpike trusts in Cardiganshire, as ascertained in 1829, was 2; the number of miles of roads under the charge of the trustees was 250; the annual income arising from the tolls and parish composition was 1752*l.*; the annual expenditure 1662*l.*

The county expenditure for various purposes, exclusive of the relief of the poor, was as follows in 1833:—

	£.	*s.*	*d.*
Bridges and roads leading to them	378	12	0
Gaols	6	8	0
Expenses of criminal trials at quarter-sessions .	102	7	0
,, circuits . .	39	18	2
,, bridge-master and county surveyor .	31	10	0
,, sheriff and under sheriff . .	4	6	6
,, coroners . .	47	9	6
,, militia . . .	21	0	0
,, county elections .	29	13	10
,, shire halls . .	10	13	4

The sum levied for county rate in 1833 was 1500*l.*

The number of persons charged with criminal offences in Cardiganshire, in the three septennial periods ending with 1820, 1827, and 1834, were 72, 58, and 63 respectively, making an average of 10 annually in the first, of 8 in the second, and of 9 in the last period.

The number of persons tried at quarter-sessions in 1831, 1832, and 1833, were 9, 4, and 2, respectively: of these there were committed for—

	1831.	1832.	1833.
Felonies . .	8	1	2
Misdemeanors .	1	3	0
	9		2
The number convicted was	4	0	2
,, acquitted	4	2	0
Discharged by proclamation	1	2	0

At the assizes and sessions in 1835, there were only 15 persons in this county charged with crimes; out of this number 1 was tried for housebreaking, 11 were tried for simple larceny, 1 for sheep-stealing, 1 for larceny from the person, and 1 for riot. Of these offenders 8 were convicted; of whom were sentenced—1 to transportation for 7 years, and 6 to imprisonment for various periods between 2 years and under 6 months; the remaining 1 was discharged on sureties. Two out of the 15 offenders were females convicted of simple larceny, 1 of these was between 16 and 21 years of age, the other above 60 years. The ages of the males were 2 aged 12 years or under, 1 aged 16 years and above 15, 3 aged between 21 and 16, 2 between 21 and 30, 3 between 30 and 40, 1 between 40 and 50, and 1 between 50 and 60. In the whole number 9 could read and write, 1 could read only, and 3 could neither read nor write, the degree of instruction of the remaining 2 was not ascertained. The proportion of the offenders to the population was 1 in 4318. The centesimal proportions in which the various crimes were committed were as follows:

Offences against property committed with violence	6·67
Offences against property committed without violence	86·66
Riot	6·67
	100

Cardiganshire has one savings-bank: the number of depositors and amount of deposits in the three years ending 1834 were respectively as follow:

	1832	1833.	1834.
Number of depositors .	671	683	321
Amount of deposits .	£15,506	15,973	9589

The various sums placed in the savings-bank in 1834, and the number of depositors, are thus distinguished into classes:—

£.	Depositors.	Deposits.
Not exceeding 20	153	2183
„ 50	123	3691
„ 100	34	2366
„ 150	9	1038
„ 200	2	311
	321	£ 9589

Education.—The following statements are taken from an abstract of the inquiry on education made by order of parliament in the session of 1835:—

	Schools	Scholars	Total
Infant Schools	3		
Number of infants at such schools, aged from 4 to 7 years:—			
Males		40	
Females . . .		30	
			70
Daily Schools	92		
Number of children at such Schools, aged from [illegible] to 14 years:—			
Males		1239	
Females . . .		669	
Sex not specified		2174	
			4082
Total number of Schools	95		
Total of children under daily instruction .			4152
Sunday Schools.	175		
Number of children and others at such Schools, aged from 4 to 90 years:—			
Males		3,425	
Females		3,284	
Sex not specified		11,940	
			18,649

Maintenance of Schools.

Description of Schools.	By endowment		By subscription		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars	Schls.	Scholars	Schls.	Scholars.	Schls	Scholars.
Infant Schools	—	—	—	—	3	70	—	—
Daily Schools	14	664	4	194	68	2844	6	380
Sunday Schools	2	85	168	18,018	3	150	2	396
Total...	16	749	172	18,212	74	3064	8	776

Schools established by Dissenters, included in the above statement:—

	Schools.	Scholars.
Daily Schools	5	267
Sunday Schools	105	14,021
Schools established since the year 1818:		
Infant and other daily schools .	26	2,041
Sunday Schools	149	16,985

There appear from the return to be 3 boarding schools in Cardiganshire, which are included in the daily schools. Most of the Sunday schools are attended by adults and aged persons, as well as children: it is said many continue in them to their death. Thirty-two of the Sunday schools are returned from places where no other schools exist; and the persons who attend them, 2897 in number, cannot be supposed to receive instruction in any other school; but with this exception, it is probable that many of the scholars in the daily schools likewise attend the Sunday schools.

Calculating the average annual rate of increase in the population of the county as being the same from 1831 to 1834 as in the preceding ten years, the approximate number of inhabitants between the ages of 2 and 15 at present living in Cardiganshire is 24,521. The number of persons receiving education is 22,801; and for the reasons just stated (many of these being adults and many twice enumerated), we find that there must be a considerable proportion of the young population not receiving education in this county. There is a lending library of books attached to one of the schools.

CA'RDINAL, the highest dignity in the Roman church and court next to the pope. The cardinals are the electors of the pope, and his councillors.

In the early times of the church this title was given to the incumbents of the parishes of the city of Rome, and also of other great cities. The term is derived from the Latin adjective 'cardinalis,' which means 'principal,' or from the substantive 'cardo,' which means a 'hinge,' the cardinals being the hinges or supports of the church, and the pillars of the Roman clergy. There were also cardinal deacons, who had the charge of the hospitals for the poor, and who ranked above the other deacons. The cardinal priests of Rome attended the pope on solemn occasions. Leo IV., in the council of Rome, 853, styled them 'presbyteros sui cardinis.' Afterwards the title of cardinal was given also to the seven bishops suburbicarii, or suffragan of the pope, who took their title from places in the neighbourhood of Rome, namely, Ostia, Porto, Santa Rufina, Sabina, Palestrina, Albano, and Frascati. These bishops were called hebdomadarii, because they attended the pope for a week each in his turn. The cardinals took part with the rest of the Roman clergy in the election of the pope, who was often chosen from among their number. About the beginning of the twelfth century, the popes having organized a regular court, bestowed the rank of cardinal priest or deacon on any individual of the clergy or even laity that they thought proper, whether Roman or foreign, giving to each the title of some particular church of Rome, without any obligatory service being attached to it. The churches which give titles are, however, even yet, under the complete jurisdiction of their respective titulars. Thus they made the cardinals a separate body elected for life; and the officiating priests of the Roman parishes were by degrees deprived of the title of cardinals. Nicholas II., in 1159, issued a decree, limiting the right of election exclusively to the cardinals thus appointed by the pope, leaving however to the rest of the clergy and the people of Rome the right of approving of the election of the new pope, and to the emperor that of confirming it. In course of time however both these last prerogatives became disused. Alexander III., in 1179, issued a decree, requiring the unanimous vote of two-thirds of the cardinals to make an election valid. For a long time the bishops in the great councils of the church continued to take precedence of the cardinals. In France, Louis XIII., in the sitting of the parliament of Paris of the 2nd October, 1614, first adjudged to the cardinals the precedence over the ecclesiastical peers or bishops, and abbots. This precedence however has been often contested. Pius V., in 1567, forbade any clergyman to assume the title of cardinal except those appointed by the pope. Sixtus V., in 1587, fixed the number of cardinals at seventy, namely, the six bishops suburbicarii above-mentioned (the title of Santa Rufina being joined to that of Porto, and that of Velletri to Ostia), fifty cardinal priests, and fourteen deacons. Most of the cardinals, both priests and deacons, bear the title of a church of the city of Rome. Several of the cardinal priests are bishops of some particular diocese at the same time; still they bear the title of the particular church of Rome under which they were made cardinals. The body of the cardinals is styled the Sacred College. The number of seventy is seldom complete, the pope generally leaving some vacancies for extraordinary cases. Most of the cardinals who reside at Rome either enjoy ecclesiastical benefices, or are employed in the administration either spiritual or temporal; others belong to wealthy families, and provide for their own support; and those who have not the same means receive an allowance from the government of about 800*l.* per ann., on which a deduction is made of 10 per cent. Several of the cardinals belong to monastic orders, some of whom, even after their promotion, continue to reside in their respective convents. The establishment of a cardinal is generally respectable, but moderate: a carriage and livery-servants are however an obligatory part of it. They generally dress in a suit of black, after the garb of clergymen, but with red stockings, and a hat bordered with red. On public occasions their costume is splendid, consisting of a red tunic and mantle, a 'rocchetto' or surplice of fine lace, and a red cap, or a red three-cornered hat, when going out. Members of religious orders, if created cardinals, continue to wear the colour of their monastic habit, and never use silk. The present pope, being a Camaldolese monk, was always, when a cardinal, dressed in white. This costume began to be adopted in the thirteenth century. When the pope promotes a foreign prelate to the rank of cardinal, he sends him a messenger bearing the cap: the hat can only be received from the pope's own hands; the only exception is in favour of members of royal houses to whom the hat is sent. Urban VIII., in 1630, gave to the cardinals the title of Eminence, which was shared with them by the grand master of the order of Malta, and the ecclesiastical electors of the German or Roman empire only. The pope often employs cardinals as his ambassadors to foreign courts, and the individual thus employed is styled Legate *a Latere.* A cardinal legate is the governor of a province, known by the name of a Legation, whereof, till the late revolution, 1830, there were four. The chief secretary of state, the camerlengo or minister of finances, the vicar of Rome, and other leading official persons, are chosen from among the cardinals.

The Council of Cardinals, when assembled under the presidency of the pope to discuss matters of church or state, is called 'Consistorium.' There are public consistories, held on some great occasions, which correspond to the levees of other sovereigns, and private or secret consistories, which are the privy council of the pope. With regard to the forms of the election of a pope, see CONCLAVE.

In Moreri's Dictionary, art. 'Cardinal,' is a list of all the cardinals elected from 1119 till 1724, their names, countries, titles, and other dignities, the date of their election, and that of their death, which may be found useful for historical reference.

CARDINAL POINTS. [COMPASS.]

CARDING. [WOOL.]

CARDITA. [SUBMYTILACEA.]

CARDITIS, inflammation of the heart. When this term is used in its strict sense, it denotes inflammation of the muscular substance of the heart. True inflammation affecting the muscular substance of the heart, and restricted to its fleshy fibres, is a rare disease. But little is known of the symptoms of this malady during life; and perhaps the only unequivocal evidence of its existence afforded by examination of the organ after death, is the presence of pus infiltrated among the muscular fibres. [HEART, DISEASES OF.]

Carditis, or inflammation of the heart, is a disease oftener observed in the horse than in any other domesticated animal. Its symptoms are very characteristic. The pulse is quickened to a considerable degree; but it is also peculiarly bounding and violent. The beatings of the heart may be seen to shake the whole of the frame, and may be heard at a distance of several feet, while the countenance expresses unusual excitement, and there is an unwonted energy attending every motion.

The remedy is simple, and generally effectual. The horse should be bled, until the action of the heart is materially subdued, and the bleeding should be repeated if the bounding pulse threatens to return. A strong dose of physic should be given, and digitalis administered in large and frequent doses.

If the disease is suffered to proceed, the inflammation will speedily extend to the pericardium: and the consequence of inflammation of this membrane will be, the effusion of serous fluid into the bag of the heart, impeding, and at length arresting its pulsation. The approach of this termination of carditis will be indicated by the weakened intermittent pulse roused to a fluttering action by the least disturbance, and by the obscure struggling of the heart as heard when the ear is applied to the left side.

CARDOON, a kind of artichoke, the *Cynara cardunculus* of botanists, a Spanish plant, the thick, fleshy stalks and ribs of whose leaves are blanched and eaten as an esculent vegetable. They are usually stewed or dressed with marrow, and have been reckoned to possess aphrodisiacal properties. In this country they are not much esteemed, but they form an important object in the Paris market. They are cultivated somewhat in the manner of celery. The seeds are sown in a hot-bed, and when the plants that they produce have become well established after two or three successive pottings, they are finally planted from three to four feet apart. When they are half-grown, in August, either the stems are earthed up, or they are blanched by having hay-bands turned round them. They are fit for the kitchen by the middle of November. The finest variety is that called the Cardon de Tours.

CARDUELIS. [FRINGILLIDÆ.]

ÇARIAMA or SARIAMA (zoology); the name by which the *Palamedea cristata* of Gmelin, *Dicholophus cristatus* of Illiger, *Microdactylus* of Geoffroy, the *Saria* of the Guaranis of Paraguay, and the *Seriema* or *Ceriema* of the Brazilian natives, is known to the Portuguese colonists of Brazil.

Maregrave, Piso, D'Azara, Geoffroy, and the Prince de Wied, have entered into a detailed history of this bird, which has always attracted the notice of zoologists on account of the curious relations which its structure indicates to the *Grallatores* (waders), the gallinaceous birds, and even the Struthionidæ.

Locality.—The great solitary mountain-plains, surrounded by the forests which extend over so large a proportion of Brazil, and where its sonorous voice often breaks the silence of the desert. It is also found in Paraguay, but is said to occur there more rarely.

Food.—In a state of nature lizards, insects, and molluscous animals, and not improbably small seeds occasionally.

Habits.—The habits of the wild Çariama are of the most retired description. A tenant of the vast solitudes that form its wide spreading home, it flies from the face of man; and being almost always on the watch, is very difficult of approach. Stalking slowly on the plain its eye instantly notes the distant intruder, and, after a moment's hesitation, it decides either to stay or fly, according to the circumstances. Those who have had the best opportunities of observing them in their native wilds state that the hunters, though surrounded by these birds, cannot, without considerable labour, obtain them. As soon as the bird perceives that it is pursued, it sets off with great rapidity: the pursuer follows on horseback, but it is not till after a sharp and tedious course, with all its turns and windings, that the Çariama, wearied out, either crouches on the ground, or alights on some bush or tree. Till this happens the horseman in vain seeks for an opportunity to throw his lasso or pull his trigger.

But wild as the bird is in its natural state, it is easily domesticated, and will live sociably with the other tenants of the poultry-yard. In this state they will eat little pieces of meat, but are said to refuse maize, though it is probable that other kinds of grain may not be disagreeable to them. When thus tamed they will walk about the hamlet or village where they have been brought up, and even return after taking short trips in the fields like the poultry. The flesh is described as very good food; the Brasilians however do not hunt it for the game-bag.

Nest, &c. composed of dry sticks and branches, covered with cow-dung, and placed upon a low or a moderately high tree. The eggs are generally two in number and white.

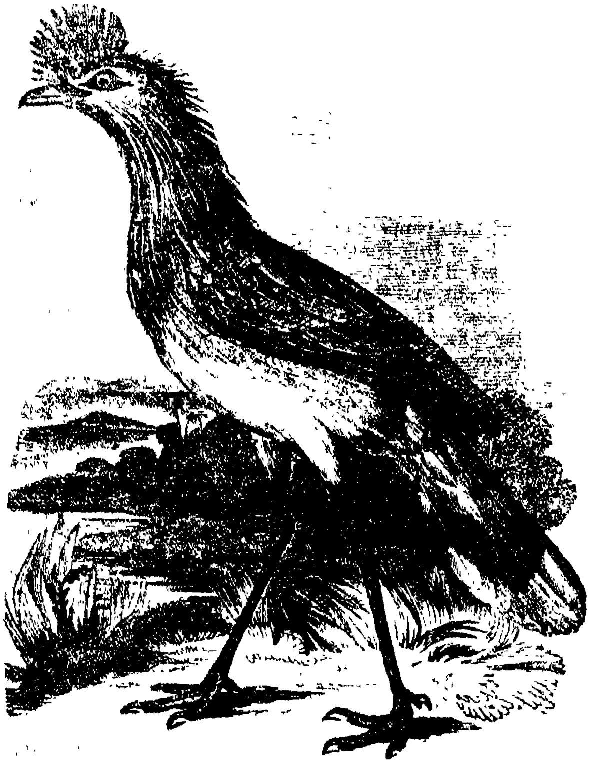
Description.—Neck covered with long, loose, barbed feathers, floating and silky upon the nape somewhat like those of the bittern: when the bird is excited or frightened it can raise them. A light crest consisting of a few disunited feathers forms an ornamental tuft on the front, and advances upon the base of the bill which it overshadows, reminding the observer of the crests of the Rupicolæ (cocks of the rock) in its disposition. Space round the eyes naked, the nakedness, which is bluish, reaching to the bill. The

upper *eye-lid* fringed with long dark eye-lashes. long
and slender, and the toes very short, whence fray's
name. *Tail* rounded and of moderate length.

The general colour of the Çariama is an earthy-brown on the upper parts, while the lower parts are whitish. All the neck feathers are finely rayed with zig-zags of darker brown than that which forms the general ground colour of the plumage. The two middle feathers of the tail are brown: the others for the most part black, with white extremities, and marbled with black upon a white ground at their insertion. The wing-feathers are blackish and traversed by white bands dotted with blackish. There are delicate zig-zags of a clear brown on the feathers of the front of the neck, the ground colour of these feathers being whitish. The feathers of the breast and belly are longitudinally rayed with white in the direction of the shafts. The naked part of the leg, the feet, and the toes are of an orange-red. The bill, which is of a bright coral red in the adult, is blackish or marbled with black and reddish in the younger birds. The iris is yellow.

D'Azara gives thirty inches as the length of the young bird described by him; that of the Prince de Wied was half an inch more, and the adult male of the museum of the Pays Bas, from which Temminck's figure was taken, measures, according to him, thirty-two inches.

Nestlings.—Covered with down, and with the iris of a very lively yellow. They are very soon able to run.



[Dicholophus cristatus.]

Temminck, after observing that the Çariama at first view seems to offer some resemblance to the secretary bird of Africa (*Gypogeranus serpentarius*), remarks that this resemblance vanishes upon a closer inspection, and that, if it be permitted to form any judgment from the forms solely, it would seem probable that the skeleton of the Çariama, which was not known when he wrote, ought to have some relationship with that of the common bittern (*Botaurus stellaris*), of the Agami (*Psophia crepitans*), and the *Grallatores* generally. There is now a skeleton of a female in the museum of the Zoological Society of London, presented by the earl of Derby, in whose possession the bird died, and as the form is a very peculiar and interesting one, we subjoin Mr. Martin's description of it in 'The Proceedings' of the Society:—

'In its general aspect the skeleton of the Çariama is very remarkable. The comparative shortness of the neck, the compactness of the chest and stoutness of the ribs, together with the abbreviated condition of the wings, appear as if out of harmony with the length of the limbs, especially of the *tibia* and *tarsus*, while the toes concluding this length of limb are short, the hinder one being situated high and not touching the ground.

'The skull, as in the cranes, is arched above, but rises on the *vertex* to a more abrupt elevation (the arch in the Stanley crane being a regular sweep from the base of the upper mandible to the *occiput*. The orbits are large and separated by a bony *septum*, with a central and posterior perforation, and a slight superior fissure. In the Stanley crane the central perforation is large and continuous with the posterior; the superior fissure being also more decided. The supra-orbital process of the lacrymal bone is large, prominent, and directed backwards, as it is in the Stanley crane. There is also a large posterior orbital process, forming part of the rim of the orbit; and before the *os quadratum* there projects forwards and downwards a process of the temporal bone, analogous, I suspect, to the zygomatic process, for the long bone stretching to the upper mandible from the *os quadratum*, which in the present bird is remarkably slender, cannot be called a true *zygoma*. Between these two processes is the depression for the temporal muscle. The nostrils are large, wide, ovoid, and open.

'In the lower jaw there is nothing remarkable. It may be observed however that a slit or a long foramen marks the union of the basal to the anterior portion of the bone, instead of a simple suture. The coronoid process is very small.

'The *vertebræ* are short and stout, and more resemble those of a gallinaceous bird than of a crane; in fact, they differ little from those of the crested curassow. Their number is as follows:—

Cervical . . .	13
Dorsal . . .	7
Sacral . . .	12 apparently
Caudal . . .	8

But that a rib arises on each side from it, the last or seventh *dorsal vertebra* is so completely consolidated to the *sacrum* that it cannot be distinguished from that portion of the column; this is also the case in the black crested curassow, with the last dorsal *vertebra*, and in the Stanley crane with the two last.

'The *sternum* differs considerably in figure from that of the Stanley crane. For independently of the absence of a channel in the anterior edge of the keel for the reception of the *trachea*, the keel is neither so deep, nor is its anterior *apex* even in contact with the point of the *os furcatum* (there being a firm consolidation in the Stanley crane), while its posterior edge is narrow and prolonged as in gallinaceous birds, whereas in the Stanley crane it is broad and squared. The total length of the *sternum* is 4⅝ inches. The greatest depth of the keel 1¼. The keel does not arise abruptly from the body of the *sternum*, but the latter merges gradually into it.

'The *os furcatum* is very slender and depressed towards the coracoid bones, its figure is triangular, and the *apex* does not reach the keel of the *sternum* by nearly half an inch. The Çariama is a bird of feeble powers of flight, very different from the crane in this respect, and exhibiting an according modification of the osseous parts connected with aërial progression.

'The ribs, seven in number on each side, are short and strong; the first two are false: in the Stanley crane I can only find one false rib on each side; while all the rest are long, somewhat slender, and extend nearly two inches beyond the posterior margin of the *sternum*; whereas in the Çariama the posterior sternal *apex* extends beyond the ribs, which here make a very obtuse angle at their junction with the cartilages, or rather bones of sternal attachment.

'The clavicles offer nothing remarkable.

'The bones of the wings are short, the fore arm and *humerus* being of equal length—4¼ inches; the hand consists of the usual bones in birds, and is about 3¼ inches in length.

'The *femur*, as in the crane, is short and strong, measuring 3¼ inches. The *tibia* is slender, measuring 6¼ inches in length, the projecting *crista* before its upper articulating surface is very bold; as in the crane, there is a large internal plate and an external pointed process, with a deep hollow between them, occupying the front of the upper end of the *tibia*. The *fibula* is, as usual, a slender stylet, and 3 inches long. The *tarsus* is 6¼ inches long, of a squared form towards its upper extremity, with an interior and posterior groove very strongly marked, and a slighter groove

on each side. The accessory
the base of the hind toe.
an inch from the lower extremity of the *tarsus*. The toes are short and stout, but consist of the usual number of *phalanges*.

'Though the Cariama, in its osseous structure, exhibits but little resemblance to the birds of the *Raptorial* order, it approaches that order very remarkably in the structure of the eye, which is surrounded by a firm consolidated osseous ring. This ring departs materially in its formation from what obtains among the *Grallatores* generally, where it is imbricated, and slight, and indeed scarcely merits the name of osseous.'

Our limits will not permit us to enter at large into the anatomy of the bird, for which we refer the reader to Mr. Martin's paper, but we may observe that, according to Mr. Martin, 'In the whole of the visceral arrangement a close affinity may be observed to the *Grus* tribe. In the Stanley crane (*Anthropoides paradisæus*, Bechst.) the intestines are similarly disposed in folds or loops, and the two *cæca*, given off 6 inches from the *anus*, are 4 inches long. In the Stanley crane however the muscular coat of the gizzard is thicker than in the Cariama, being in some parts an inch across, while in the latter bird it is about ½ of an inch; hence is there in this point an index of a less vegetable regimen. In the Stanley crane, the total length of the intestines is 5 feet 3 inches. In the Cariama, it is 3 feet 5½ inches.

CARIBS, or **CARIBBEES**, is the name given by the first European navigators to one of the aboriginal tribes of South America, and which has been adopted by all European nations, though they call themselves Carina, Calina, and Callinago.

At the time of the arrival of the Europeans in America the Caribs were in possession of the smaller islands of the West Indies which lie between Puerto Rico and the Gulf of Paria. The Caribs made stout resistance against the European intruders; but at last they were compelled to yield and to abandon the islands after the greater part of them had fallen in continually repeated conflicts. A small number still exist on the Islands of Trinidad, St. Vincent, and Dominica. On St. Vincent they were formerly more numerous, but on their rebellion in 1796 they were transplanted by the English to the Island of Roatan, in the Bay of Honduras, whence, in 1797, they were removed by the Spaniards to the neighbourhood of Truxillo in Guatemala, where they still live; but a considerable number of them have lately been destroyed by the government, on account of their turbulent and rebellious character.

Though the Caribs have been nearly extirpated from the islands, there still exists a considerable number on the continent of South America. They are principally found on the banks of the Lower Orinoco and of the Caroni, one of its principal tributaries; but they extend also farther S., and a few of them are met with in the settlement of Demerara and in French Guiana. Those who live within the republic of Venezuela are partly settled in the missions along the Caroni and Orinoco, but a considerable number are still independent under their own caciques, to whom they pay great respect.

The Caribs are distinguished from the other native tribes of America by their athletic stature and their great courage and firmness of purpose. They speak of other savages with contempt and disdain, and think themselves a privileged race. They are also evidently gifted with mental powers superior to those of the other tribes. The Caribs have been accused of cannibalism.

Humboldt is of opinion that the Galibes in Cayenne and the Tuapocas and Cunaguaras, on the coast of Cumanà, and the Jaoi in Trinidad and the province of Cumanà, and perhaps also the Guarivas, are tribes of the great Caribbean nation. Their language differs from those of their neighbours: there is indeed a frequent analogy between the words and the grammatical structure in the languages of these tribes; but still their language must, to some extent, be considered as different, since they are unable to under-
ther. (Humboldt; Haefkens, &c.)

ISLANDS, THE, have received their name
es. By this denomination are understood the whole series of islands, which on the N. begin with the Virgin Islands, and on the S. terminate with Trinidad. [ANTILLES.]

CARICA, a remarkable tree found in various parts of South America, with a simple unbranched erect trunk, from twelve to twenty feet high, abounding in a milky juice, having broad 7-lobed leaves, a foot at least long, and unisexual flowers, the males of which are monopetalous, with ten short stamens inserted in the mouth of the corolla; the females polypetalous, with a single ovary having a starry sort of stigma. The fruit is thus described in the 'Botanical Magazine:' 'The corolla falls away, and the germen in coming to maturity becomes pendent; the tree, too, advancing in height casts its lower leaves from below the flowers, and the fruit constituting a large oblong kind of berry, or more correctly speaking pepo, rests suspended upon the leafless part of the trunk, much in the same way as that of the Artocarpus or bread-fruit. The surface, when the fruit is ripe, is a pale and rather dingy orange-yellow, obscurely furrowed, and often rough with little elevated points. The flesh is very thick, coloured, but paler than the outside, and there passes through it longitudinally five bundles of vessels. In the centre is a considerable cavity, with five longitudinal ridges, and these are thickly clothed with numerous seeds.' This fruit is called the *papaw*, and is accounted of considerable interest in the tropical part of the world. An excellent history of its uses is compiled in the work already quoted, from which we borrow the following: 'The papaw tree is of rapid growth. St. Pierre probably spoke from his own knowledge, when he described Virginia as having planted a seed, which in three years time produced a trunk twenty feet high, with its upper part loaded with ripe fruit. It is for the sake of this fruit, mainly, that the plant is cultivated; but if the flavour were not better than that yielded by what ripened in our stove, I cannot recommend it as at all agreeable. Browne, in his "Natural History of Jamaica," tells us, that "it has a pleasant sweetish taste, and is much liked by many people; that while young it is commonly used for sauce; and when boiled and mixed with lime juice and sugar is not unlike, or much inferior, to that made of real apples, for which it is commonly substituted." In the opinion of Sloane it is not a very pleasant fruit, even when helped with pepper and sugar; and the more ordinary use, he adds, of this fruit is before it is ripe, when, as large as one's fist, it is cut into slices, soaked in water till the milky juice is out, and then boiled and eaten as turnips, or baked as apples. The juice of the pulp, according to Descourtilz, in the "Flore Médicale des Antilles," is used as a cosmetic, to remove freckles on the skin caused by the sun; and the negroes in the French colonies employ the leaves to wash their linen instead of soap. As a medicinal plant the papaw tree is particularly deserving of notice. Hernandez long ago spoke of the milky juice of the unripe fruit as a powerful vermifuge; which has been confirmed by M. Charpentier Cossigni, as mentioned in the "Asiatic Researches" by Dr. Fleming (vol. ii., p. 162). A single dose, that gentleman says, is sufficient to cure the disease, however abundant the worms may be. Another French writer (Poupée Desportes) recommends the use of the seed instead of the juice. But the most extraordinary property of the papaw tree is that which is related, first I believe by Browne, in his "Natural History of Jamaica," namely, that "water impregnated with the milky juice of this tree is thought to make all sorts of meat washed in it very tender; but eight or ten minutes' steeping, it is said, will make it so soft that it will drop in pieces from the spit before it is well roasted, or turn soon to rags in the boiling." Mr. Neill mentioned this circumstance more fully in his interesting "Horticultural Tour through Holland and the Netherlands;" and it has repeatedly been confirmed to me by gentlemen of this country who have been long resident in the West Indies, and who speak of the employment of the juice for such a purpose as of quite general occurrence; and more, that old hogs and old poultry which are fed upon the leaves and fruit, however tough the meat they afford might otherwise be, are thus rendered perfectly tender, and good too, if eaten as soon as killed, but that the flesh very soon passes into a state of putridity. The juice causes a separation of the muscular fibres. Nay, the very vapour of the tree serves the purpose: hence many people suspend the joints of meat, fowls, &c., in the upper part of the tree, in order to prepare them for the table. Such is the effect upon hogs that feed upon the fruit, that the good housewives reject the flesh of such if it is destined for salting, well knowing that it is not sufficiently firm for that purpose.

Whether this power of hastening the decay of meat be attributable to the animal matter or fibrine contained in the juice of the Papaw or not, I will not pretend to say; but the presence of such is a fact scarcely less wonderful than the property just alluded to. Two specimens of the juice were brought from the Isle of France; in the one it had been evaporated to dryness, and was in the state of an extract; in the other, the juice was preserved by being mixed with an equal bulk of rum. Both were subjected to analysis by Vauquelin. The first was of a yellowish-white colour, and semi-transparent. Its taste was sweetish. It had no smell, and was pretty solid; but attracted moisture when kept in a damp place. The second was reddish-brown, and had the smell and taste of boiled beef. When the first specimen was macerated in cold water, the greatest part of it dissolved: the solution frothed with soap. The addition of nitric acid coagulated it, and rendered it white; and when boiled, it threw down abundance of white flakes. When the juice of the Papaw is treated with water, the greatest part dissolves; but there remains a substance insoluble, which has a greasy appearance. It softens in the air, and becomes viscid, brown, and semi-transparent. When thrown on burning coals it melted, let drops of grease exude, emitted the noise of meat roasting, and produced a smoke which had the odour of fat volatilized. It left behind it no residue. The substance was fibrine. The resemblance between the juice of the Papaw and animal meat is so close, that one would be tempted to suspect some imposition, were not the evidence that it is really the juice of a tree quite unquestionable. This fibrine had been supposed, previously, to belong exclusively to the animal kingdom; but it has since been found in other vegetables, especially in Fungi.'

CARIESFORT, a decayed borough in the barony of Ballinacor and county of Wicklow in Ireland; it formerly returned two members to the Irish parliament, for which John Earl of Cariesfort received 15,000*l.* compensation at the Union. The only object of interest connected with Cariesfort is the charter-school established 4th Charles I., by 53 Geo. III., c. 107, vested in the commissioners of education in Ireland, and subsequently regulated along with the other royal charter-schools of Ireland by acts of Geo. IV. and Will. IV. There are now about 361 acres of land belonging to the school, which educates 110 scholars, and on which 500*l.* have been lately expended. The town is a miserable village, and is now known by its antient name of Moyereedin. (*Reports of Commissioners.*)

CARILLON. [CHIMES.]

CARINA, in botany, the two oblique front petals of a papilionaceous flower, united by their contiguous edges into an organ having a figure something like that of the keel of a boat.

CARINA'RIA (zoology), the name of a genus of molluscous animals arranged by Cuvier under his fifth order of Gasteropods (Lamarck's Heteropoda) as the type of that order, and by De Blainville under the first family (Nectopoda) of his order Nucleobranchiata. The shells of this genus were formerly known to collectors under the name of 'Venus's Slipper' and 'Glass Nautilus;' indeed one of the species is the *Argonauta vitreus* of Gmelin.

M. Verany's description published in the 'Zoological Journal,' vol. V. p. 325, in French, is tolerably accurate, with the exception of his having mistaken the back for the belly of the animal, and *vice versâ*. The error arose, no doubt, from the habit of the animal, which swims upon its back, and thus M. Verany, without adverting to the situation of the brain and the relative position of the other parts, appears to have been led to describe the side that floated uppermost as the back, whereas that part, which is analogous to the belly in the Gasteropods, occupies that position not only when the animal is in motion, but most probably when it is at rest.

The body is subcylindrical, elongated, transparent, dotted with elevated points, prolonged posteriorly, and furnished towards the upper part of its posterior extremity with a sort of fin which performs the part of a rudder. A reddish, thin, compressed, subcircular fin, beautifully reticulated by decussating muscular fibres, furnished with a sort of acetabulum or sucker, rises from the belly nearly opposite to the point on the back occupied by the shell. With the aid of this fin it floats along. M. Verany says that notwithstanding the greatest possible attention he has not been able to discover the use of the sucker, or rather suctorial disk, in the ventral fin; but there can be little doubt that it is analogous to the foot in gastropods, and that the animal avails itself of its powers of adhesion by sticking to rocks or other submarine bodies, and thus lying at anchor, as it were, in repose, with the frail shell that protects the circulating and respiratory organs together with the liver and generative gland lowermost, the same position occupied by it when the animal is in motion.

The head is capable of contraction within the body, and is provided with a sort of retractile proboscis. There are two tentacula of some length and of a subconical shape placed laterally at the insertion of the head; and there are two eyes situated at the base of the tentacula. The mouth is furnished with a circular jaw, armed with four rows of teeth, of which the two internal ones are fixed and small.

Organs of respiration, &c.:—These, together with the heart and vent, are protected by a delicate transparent shell, somewhat compressed, without a spire, but with a summit a little recurved backwards, and the opening wide, entire and oval. The vent is under the edge of the mantle which envelops the organs above mentioned, and lines the shell.

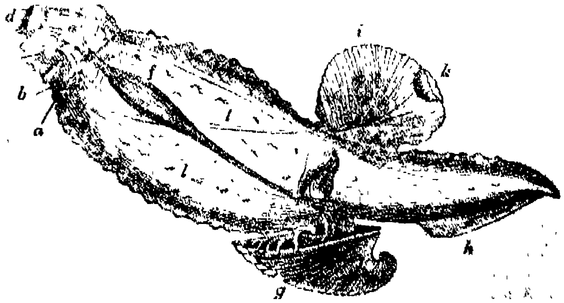
The sexes, according to M. Verany, are separated as in the Firolæ (*Pterotrachea*); the sexual organ of the male being placed a little anteriorly on the right side under the subcircular belly fin; that of the female is near the vent.

Digestive organs.—These consist of a retractile tube furnished within with a horny rasp, and a short œsophagus, opening into a slightly dilated stomach which is continued into an intestinal tube passing straight towards the shell into which it enters and, making a convolution, terminates in the vent.

Nervous System.—There is between the eyes a ganglion from which many nerves are given off, and of these six are directed forwards and four backwards. Of the six directed forwards two go towards the mouth, and appear to provide for the action of the proboscis, two belong to the tentacula, and two to the eyes. Of the four directed backwards two go directly to the nucleus in the shell, and the other two unite under the fin from whence they ramify into five branches, three of which are appropriated to the belly-fin, and two go towards the tail.

Example. Carinaria Mediterranea.—M. Verany states that it is to be found all the year on the coasts (in the neighbourhood of Nice), but that it is sufficiently abundant in the months of May, June, and July. He further observes that it is rare to find it with the shell entire, that it feeds on gelatinous bodies and on very small fishes, such as *Atherina nana* (the dwarf Atherine), and that he has often found in the stomach the remains of other *carinariæ*, which satisfies him that the species is mutually destructive.

Delle Chiaje, who has placed the animal in its proper position with relation to the brain, has given a careful and detailed account of its organization in his 'Memorie sulla Storia e Notomia degli Animali senza Vertebre del Regno di Napoli,' vol. ii. p. 214, illustrated in his plates 14 and 15. Delle Chiaje makes the spermatic canals rise at the posterior base or insertion of the ventral fin and proceed to the genital organ, near the origin of what we have termed the rudder fin; but he gives no external view of the apparatus so conspicuous in M. Verany's figure.



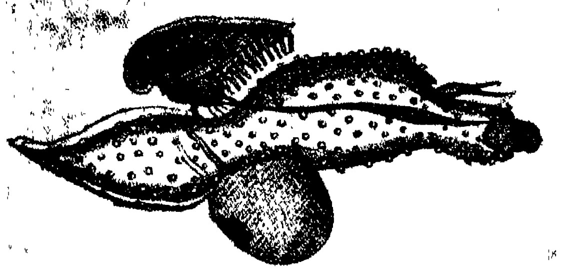
[Carinaria Mediterranea, male.]

a, situation of the ganglion or brain; *b*, eye; *c*, head; *d*, retractile tube; *e*, tentaculum; *f*, digestive tube; *g*, shell containing the organs of respiration, heart, &c.; *h*, the posterior or rudder-fin; *i*, ventral fin; *k*, the sucker; *l*, *l*, nerves. The figure, with slight modification, is taken from Verany's.

We had an opportunity of comparing together a specimen of Carinaria from the Mediterranean and one captured by Mr. George Bennett in the Indian Ocean, 33° S. lat., and 22° W. long., but the comparison did not present any perceptible difference between the specimens. *Carinaria Me-*

diterranea, then, may afford another instance of the inconvenience of a specific name adopted from the localite where a specimen has been taken. Lamarck's *Carinaria cymbium* (if indeed it be a Carinaria, see the figure referred to in Gualtieri, tab. 12. fig. D.) is microscopic, no bigger than a grain of sand, 'de la taille d'un grain de sable.'

Geographical Distribution of the Genus.—Carinaria has never yet been taken in any other than warm latitudes. Three species, *C. vitrea*, *C. fragilis*, and *C. Mediterranea*, are recorded without reckoning Lamarck's *C. cymbium*.



The above is copied from the Iconographie of Cuvier's Animal Kingdom, and represents the Carinaria with its back uppermost. It is denominated *Carinaria cymbium*, but there can be no doubt that it is *Carinaria Mediterranea*.

We have little doubt that the animal of Argonauta will be found to bear a strong resemblance to Carinaria. [CEPHALOPODA. PAPER NAUTILUS.]

CARINTHIA (in German, *Kärnthen*), a duchy of the Austrian empire, constitutes the northern part of the government of Laibach, and is comprehended in two of its subdivisions, the circles of Klagenfurt, formerly Lower Carinthia, and Villach, formerly Upper Carinthia. On the E. and N.E. it is bounded by Styria, on the N.W. by Salzburg, on the W. by the Tyrol, and on the S. by the Fridul and the circle of Laibach. It is situated between 46° and 48° N. lat., and 12° and 15° E. long., and occupies an area of 3180 square miles. Its northern and southern districts, between which the valley of the Drave runs from W. to E., are Alpine regions; the land enclosed between these enormous masses does not enjoy the light and heat which are indispensable to successful cultivation, and the produce of the soil is insufficient for the population. The valleys between the mountains contain, however, a deep soil of sand and clay intermixed, and are very productive. Of the two mountain chains which encompass this duchy, the formation is wholly dissimilar: the northern, in its whole length, is composed of granite, gneiss, and other primitive rocks, which are not unfrequently traversed by beds and strata of quartz, sulphate of barytes, and various species of ores. This chain also contains the most elevated summits in Carinthia: the 'Glockner,' which is close to the point where its border meets the boundaries of Salzburg and the Tyrol, and has an elevation of 12,980 feet, is the highest of the Carinthian mountains. The eastern districts are bounded by the Carniolan Alps, which are much inferior in height not only to the north range but to that part of the Alps which form the bulwark of Carinthia in the south. The most remarkable feature in these Carniolan Alps is that portion called the 'Dobratsch,' or Villach Alps, whose elevation averages about 7500 feet, along the side of which runs a fine plateau. The vegetation of the highest points in this chain is confined to stunted grass, Iceland moss, and other plants resembling the vegetation of the most northerly parts of Europe.

Carinthia is richly supplied with streams. The Drave, which receives most of the rivers, enters the duchy from the Tyrol and flows for about 140 miles from W. to E., through Carinthia. The other large rivers which water it are the Gail, Möll, Liser, Gurk, Glan, and Lavant. Carinthia is full of mountain streams, such as the Loibl, Feistritz, Missling, and Fella, which flow northwards into the Drave. The duchy abounds in lakes, among which are the Worthsee near Klagenfurt, the Ossiachersee, and Mühlstadtersee, both of which issue from the Drave; the Weifsensee, the Faakersee, and lesser Raiblsee.

The natural disadvantages under which Carinthia labours cripple its agricultural industry. The arable land scarcely exceeds 290,000 acres, and the produce is not estimated at more than 35,000 quarters of wheat, 120,500 of rye, 48,380 of barley, and 67,300 of oats. But the land is proportion-[illegible] much richer in meadows and pastures, the former [illegible]timated at 371,430 acres, and the latter at 521,428. [illegible]k of animals when last taken amounted to 15,956 horses, 38,482 oxen, 77,726 cows, and 129,120 sheep. The breed of horses is much finer in Upper than in Lower Carinthia, but in the latter the breed of horned cattle is superior. The wool is of an ordinary description. Swine and goats are reared in most parts. So small a portion of the soil is laid out in garden-ground that the whole quantity is not calculated at more than about 3000 acres; and that occupied as vineyards, which are confined to Lower Carinthia, does not amount to more than about 320 acres, or exceed an average annual produce of 20,000 gallons of very inferior wine. The woods and forests cover about 570,000 acres; but until of late years they have been so much neglected that they have not yielded sufficient for the consumption of the country.

The mines of Carinthia constitute its chief wealth. The main chain of the Alps contains various metals in combination with ores, earths, sulphur, &c., and is more particularly rich in copper and iron. The circle of Klagenfurt abounds in lead and zinc. The mines of Fragant in Upper Carinthia contain inexhaustible supplies of copper; but, owing to the hardness of the stone from which it is necessary to extract it, and the scarcity of fuel in the vicinity of the mines, the yearly produce is not more than about 800 cwt. This metal is also raised at Kerschdorf in the circle of Villach, and on Mount Lumbrecht, in that of Klagenfurt. Iron ore occurs through the whole length of the Alpine chain, from the confines of the Tyrol in the W. to those of Styria in the E.; but the same natural impediments which occur with regard to copper circumscribe the value of the resources which Carinthia possesses in its iron. The principal mines at work are at Döllach, Gmünd, Freisach, Hüttenberg, where there are 18 high-blast furnaces, Waldenstein, and St. Gertraud; the produce of the whole duchy however is computed not to exceed 13,000 or 14,000 tons. In all the Austrian dominions there are no lead-works so extensive and productive as those of the 'Ore-mountain' (Erzberg), close to the Lead-mountain (Bleyberg), at no great distance from Villach in Upper Carinthia; they yield a yearly supply of between 16,500 and 17,000 tons of pure lead; the mines on the Raibl produce about 500 tons annually, and there are others in the same circle, but on a smaller scale, on the Kellerberg, at Döllach, &c. In Lower Carinthia (or Klagenfurt), the mines at Ebriach, Schwazenbach, and Windisch-Bleyberg produce about 500 tons per annum. The produce of the whole duchy is about 25,000 tons. The largest zinc and calamine works are situated on the Raibl in the southern part of Upper Carinthia; these and some minor works in the duchy yield about 400 tons of ore yearly. Some silver was formerly obtained at Menselding near Strasburg, and quicksilver at Windisch-Capel and Döllach; on the Raibl, and in the iron strata at Huttenberg, antimony is found. Immense beds of coal exist in Carinthia, but Guttaring and St. Leonhard are the only spots where they have been much turned to account. Large quantities of turf or peat are dug at Feldkirchen and at Loretto on the Worthsee. Carinthia abounds in stones of various kinds, some of which are valuable. It contains quartz, jasper, semi-opal, garnet, beryl, &c., as well as various kinds of clay, talc, limestone, &c. There are marble quarries at Velden, Uppervillach and Wasserleonburg in Upper, and at Sittersdorf, &c., in Lower Carinthia.

The population of this duchy is estimated at about 290,000 souls, of whom 124,000 in Upper Carinthia (1494 square miles) and 166,000 in Lower Carinthia (1686 square miles.) They are of two distinct extractions, the German and the Wend or Vandal; the proportion of the former to the latter is as 172 to 95, and their dialects are totally dissimilar. The increase in the number of inhabitants has not been very rapid, for, in 1816, they amounted to 267,015; in 1820 to 271,946; and in 1825 to 287,342.

The operative industry of this duchy is mostly limited to the working up of the raw materials which it produces; the manufacture of iron and iron ware holds the first place. Besides the 18 furnaces at Hüttenberg, there are 2 high-blast furnaces in Upper Carinthia; in the two circles there are likewise 61 flatting-mills, and steel and iron-plate works, &c. The whole quantity of iron and steel ware made in the duchy is estimated at 130,600 cwts., of which about 37,500 are of steel. The other manufactures consist of two manufactories of woollens, one of silk stuffs and fine cotton prints, several of ribands and cottons, and a white-lead work; the greater part at Klagenfurt, the capital of Carinthia. Independently of what has been enumerated, the duchy has few products to export, beyond horned cattle. Its internal communications are much facilitated by good roads, among which there is a skilfully constructed one across the steep and rocky Loibl into Carniola.

Carinthia possesses 11 towns, 25 market-towns, 2763 villages, and about 47,000 houses. It has been considered as one of the German possessions of the Austrian crown ever since it became an appendage of that crown in the middle of the fourteenth century. It has states of its own, consisting of four sections, namely, the bishops and dignitaries of the church, the aristocracy, the equestrian order, and the representatives of towns and places with markets. The executive power, immediately dependent upon the central government in Vienna, is exercised by the chief board of administration (*Gubernium*, literally government) at Laibach, and the head administrative authorities in the duchy itself are the provincial boards at Klagenfurt and Villach. Subordinate to the latter are 70 district commissionerships in Lower, and 14 in Upper Carinthia. The majority of the inhabitants profess the Roman Catholic religion, and the bishops of Gurk (at Klagenfurt), and of Lavant (at St. Andrä), are superintendents of all ecclesiastical affairs. The Lutherans, whose numbers amount to about 20,000, chiefly inhabit Upper Carinthia, and are within the secular jurisdiction of the consistory at Vienna.

CARI'NUS, MARCUS AURELIUS, succeeded to the throne conjointly with his brother Numerianus, after the death of their father Carus, at the beginning of A.D. 284. (Crevier, *Histoire des Empereurs Romains*.) His conduct at Rome during the absence of his father had been marked by licentiousness, cruelty, and extravagance. His brother Numerianus, whose character was good and mild, having been murdered by Aper on his return from Persia, the soldiers elected Diocletian, a soldier of fortune, who immediately put Aper to death. Diocletian then marched against Carinus. Carinus collected the troops that were in Italy, and went to meet Diocletian. The two armies met in the plains of Mœsia, near Margum and Viminacum. Carinus had at first the advantage, but many of his own officers, who detested him for his brutal conduct, rose against him, and killed him during the action. The two armies then ceased the fight, and proclaimed Diocletian sole emperor, A.D. 285.

Coin of Carinus.
[Brit. Museum. Actual Size. Silver. 29 grains.]

CA'RLI, GIA'N RINA'LDO, was born in 1720, of a noble family at Capo d'Istria, in the Venetian territory. He studied first at home, and afterwards at Flambro in the Friuli, where he applied especially to the mathematical sciences. At the age of twenty-four he was appointed by the Venetian senate professor of a new chair of astronomy and navigation established at Padua. He invented several improvements in ship-building for the Venetian navy, and had the superintendence of the naval school at Venice. After seven years he resigned his chair and returned to Istria, to attend to the management of his private affairs. During this time he visited the antiquities of Pola, which he afterwards detailed at length in his work on Italian antiquities. He had for a companion in his researches the naturalist Vitaliano Donati, whose work on the natural history of the Adriatic was edited by Carli after the author's death: 'Saggio della Storia Naturale Marina dell' Adriatico,' 4to., Venezia, 1750. In 1754 Carli published the first volume of his great work, 'Delle Monete e della Istituzione delle Zecche d' Italia' (On the History of the Coins and Currency, and on the Institution of the Mints of Italy). The second volume appeared in 1757, and the third and fourth in 1760. Carli employed nine years in the compilation of this work, during which he inspected the cabinets of medals and the archives of Milan, Turin, Tuscany, &c. A new edition, with corrections and additions by the author, was published at Milan in 1785, in 7 vols. 4to. Carli begins the monetary history of Italy with the mint of Odoacer at Ravenna, after the fall of the Western Empire, and comes down as far as the seventeenth century, describing and illustrating the numerous coins, national and foreign, which were current in Italy during those intervening ages; their weight, title, legends, and relative value, and also their value compared with the price of provisions at different epochs. He treats also of the commerce of bullion, and of the frequent alterations and deteriorations which took place in the weight and intrinsic value of the currency; he considers the whole subject both in its economical and legal aspect. Carli demonstrates, among other things, that the quantity of the precious metals in Italy was considerably greater in the fifteenth century, before the discovery of America, than in the eighteenth, and that the real price of provisions was proportionately higher; an assertion which appeared quite novel at the time, because the nominal price of provisions appeared higher at the latter period, owing to the intrinsic value of the coin being much lower than it had been formerly. In the fifteenth century every petty state of Italy had its mint at work; the mint of Venice alone, under the Doge Mocenigo, coined yearly 1,000,000 of gold sequins, besides 200,000 sequins in silver coins. All this is explained by the fact, that Italy was then the most commercial country in Europe; and it serves to confirm the accounts of the prodigious wealth of Italy previous to the French and Spanish invasions in the beginning of the sixteenth century, of which wealth the innumerable palaces, churches, paintings, and other monuments of splendour and luxury still remaining in that country are sufficient evidence.

In his 'Ragionamento sopra i Bilanci economici delle Nazioni,' Carli asserted, against the then received opinion of the economists, that the balance of trade between nation and nation proved little or nothing as to the real prosperity of each. He was also at variance with the economists in his dissertation 'Sul libero Commercio dei Grani, addressed to Pompeo Nero in 1771, in which he combated the general application of the principle of the freedom of the corn trade under all circumstances. He considered it as a question more of administration than of commerce. He quoted the example of Poland, Hungary, Sicily, Apulia, Egypt, &c., which countries produce and export enormous quantities of corn, and yet always remain poor. Another interesting work of Carli is his 'Relazione sul Censimento dello Stato di Milano.' The censimento or catasto was a survey and valuation of all the lands of Lombardy, effected under Maria Theresa, and completed in 1759 for the purpose of equalizing the land-tax and other public burthens. The plan was afterwards imitated in Prussia under Frederick II., in France under Napoleon, and in other countries. At the same time a liberal municipal system was established in Lombardy, by which every commune had its council consisting of all the proprietors inscribed in the censimento, which council deliberated upon communal affairs, made out the yearly budget, and appointed five deputies or administrators of the communal property. This system has continued in Lombardy to this day.

Carli was appointed president of the new council of commerce and public economy established at Milan as well as of the board of public studies. In these capacities he repaired to Vienna in 1765 to confer with the minister Kaunitz, and was received at court with great distinction. When Joseph II. went to Milan in 1769 he appointed Carli his privy councillor, and it was at Carli's suggestion that the emperor finally abolished the tribunal of the Inquisition, which had existed at Milan for centuries. In 1771 Carli was made president of the new council of finances, which made useful reforms in that branch of administration. His labours having seriously impaired his health, he resigned the presidency of the council of commerce, and devoted his time chiefly to complete his 'Antichità Italiche,' which appeared in 1788, 5 vols. 4to. Notwithstanding its general name the work is chiefly engrossed by the antiquities of Istria. Carli being now old and infirm, the emperor Leopold II. restored to him the whole of the emoluments which he had enjoyed when in the full exercise of his office. He lived some years longer, and died in February, 1795, leaving behind him the reputation of an enlightened economist, a learned archæologist, and a virtuous magistrate. He published many other works, among which are, 'Lettere Americane,' in which he investigates the antiquities of America, and refutes Pauw's assertions in disparagement of the natives. In his 'L'Uomo Libero ossia Ragionamento sulla Libertà Naturale e Civile dell' Uomo,' he combats Rousseau's theory of natural liberty: this is perhaps the best refutation of the 'Contrat Social.' He wrote also 'Saggio sulla Toscana,' 'Della Patria degli Italiani,' 'Indole del Teatro Tragico,' besides many dissertations on classical subjects, on the triremes, on the Argonauts, on Hesiod's Theogony, on the geography of the antients, &c. He wrote also a defence of Paolo Vergerio, bishop of Capo d'Istria, who was condemned as a heretic by Pope Paul III.; a refutation of Tartarotti, who even in Carli's time asserted the existence of sorcery; several poetical compositions, and a letter on the gout, in which he describes a new remedy which he had discovered for that disease. Carli's works were published in 19 vols. 8vo. Milan, 1784-94, exclusive of his 'Italian Antiquities.' He left also many works in MS. (Ugoni, *Storia della Letteratura Italiana*; Pecchio, *Storia dell' Economia pubblica in Italia*; Bossi, *Elogio Storico di Gian Rinaldo Carli.*)

CARLISLE, an antient city, parliamentary and municipal borough, and port, in Cumberland, 260 miles N.W. by N. from London direct distance, or 302 by the road. Carlisle is supposed to be of British origin, and there is reason to conclude that it was a Roman station, the Luguvallum of the *Itinerary* of Antoninus. Its modern name is said to be derived from the word Luel, a Saxon corruption of Luguvallum, to which the British word Caer is prefixed. It appears to have been first fortified about the time, probably, of Agricola. The Danes destroyed it about the end of the ninth century; and it remained desolate till after the Norman conquest. Its restoration, and the erection of the castle, are attributed to William Rufus. The subsequent history of Carlisle, down to the junction of the two kingdoms, is intimately connected with the wars between England and Scotland, and the history of the border feuds and forays. Carlisle was taken by David I. king of Scots, and besieged afterwards by William, called the Lion, who did not succeed in his attempt. It suffered repeated damage by fire during subsequent sieges. It was occupied on different occasions by Edward I., who, in 1306-7, held a Parliament here, at which was passed the act printed amongst the statutes of the realm under the title of 'the Statute of Carlisle.' Mary, Queen of Scotland, stopped in her flight after the battle of Langside at Carlisle, from which period commenced her long imprisonment in England. It suffered severe privations during the civil wars, having declared for Charles I. In 1745 the garrison surrendered to Charles Stuart, the mayor and corporation presenting him with the keys of the city on their knees, and afterwards proclaiming him King of Great Britain. On the city being re-taken by the Duke of Cumberland, the principal actors on this occasion suffered, some of them death, others severities little short of it.

Carlisle, as an important border-town, was early endowed with peculiar privileges: but down to the year 1745, no trade or manufacture was carried on in it of the smallest importance. Being a fortified city, and a place of retreat to the surrounding inhabitants, it was, at different periods in its early history, very populous; but after the junction of England and Scotland, under James I., it sunk into decay, from which it has only begun to recover since the commencement of the present century. The population in 1763 was about 4158; in 1780, 6299; in 1801, 10,221; in 1831, the total population amounted to 19,069.

Carlisle is divided into the antient city and the suburbs, which make together the city popularly so called. The antient city was formerly the parliamentary borough; but under the Reform Act, a large portion of the suburbs was included. The number of voters on the registry at the last general election (1834) was 946. The suburbs contain a larger population than the antient city, and about an equal number of houses. Under the Municipal Reform Act the town is divided into five wards, with ten aldermen and thirty councillors. Carlisle has returned two members to Parliament s[illegible] time of Edward I.

The principal business of Carlisle consists in its manufactures of cotton goods and ginghams, and in a coasting trade. Some traffic arises also from its lying on the great western road from London to Edinburgh and Glasgow. In 1823 a ship canal was completed from Carlisle to Bowness, on the Solway Frith, a distance of eleven miles, by means of which vessels of 80 to [illegible] tons can come up to the town. There is now frequent c[illegible]unication between Carlisle and [illegible]verpool steam-vessels. Considerable expectations of [illegible] traffic are entertained from a rail-road now in progress between Newcastle and Carlisle, which was opened between Newcastle and Blenkinsop, in July, 1836. The following is a statement of the amount of tonnage of the port of Carlisle in three different years:—

	Coastwise.		*Foreign.*	
	Inwards.	Outwards.	Inwards.	Outwards.
1823	14,220	7,908	2,159	719
1828	23,385	18,440	2,666	384
1832	22,820	23,392	2,739	741

The increase of late years in Carlisle has been considerable the new streets are comparatively wide and handsome, and the roads approaching the place are excellent. The town is very healthy. The mean quantity of rain at Carl[illegible] for 24 years, 1801—1824, was 30·571 inches. The mean height of the barometer for 24 years, 29·839 inches. The mean temperature for ditto, 47·453°.

Carlisle is pleasantly situated on an eminence, nearly inclosed by three streams. The largest of these, the Eden, runs past the city in a N.W. direction into the Solway Frith; the other two, the Caldew and the Pettrel, fall into the Eden on the W. and E. sides of the city respectively. A handsome elliptical bridge of five arches, and of white freestone, was erected over the Eden in 1812, at an expense of 70,000*l.* Two stone bridges, of one arch each, are thrown over the Caldew, and one over the Pettrel of three arches, about a mile from the town.

Before the Reformation, there were several ecclesiastical establishments in the city. In the year 1133 Henry I. erected Carlisle into a see, giving its bishop jurisdiction over a large portion of Cumberland and Westmoreland. In the third Report of the Church Commissioners (May, 1836) amongst other alterations suggested respecting the see, it is proposed that the bishopric of Sodor and Man should be united to that of Carlisle. There is but one archdeaconry in the see. Dr. Paley was archdeacon of Carlisle, and published some of his most popular works while residing in the city. He is buried in the cathedral, where a monument has been recently erected to his memory. The cathedral is an antient building of red freestone, displaying specimens of different styles of architecture, some parts of which are assigned to the Saxon times. In addition to the cathedral and St. Mary's, there are three other churches,—St. Cuthbert's, Trinity, and Christ Church.

An earldom of Carlisle was created shortly after the Norman conquest. It has become three times extinct, by surrender, attainder, and death without issue. The present earldom was revived in 1661, and is held by a branch of the Howard family.

The castle of Carlisle lies between the city and the Eden, on a slight eminence overlooking the river. It is still maintained as a garrison-fortress. Scarcely any portion of the old walls and bulwarks of the antient city now remains: a great part of the city walls, and the English, Scotch, and Irish gates, recently removed to promote the health and convenience of the inhabitants. There is no city gaol. The county gaol and county house of correction are within the city; they were finished in 1827.

There is an endowed grammar-school in Carlisle, founded by Henry VIII.; the number of other schools, as given in the Education Returns for 1835, is 47.

The city also contains a number of charities and benevolent institutions: among which are an Infirmary, lately erected, a Fever Hospital, a Dispensary, and a Humane Society. There are also two literary institutions.

The market-days are Wednesdays and Saturdays. There are fairs held in August and September, persons attending which were antiently exempted from all arrest. (*Communication from Carlisle*, &c.)

CARLOS, DON. [PHILIP II.]

CARLOVITZ (Carlovacze, Hungary), a well-built town which extends from the E. foot of the mountains which surround it to the banks of the Danube, a little to the S.E. of Peterwardein; it lies in what is termed the Captaincy or Military Frontiers of Sclavonia. It is the seat of the archbishop or metropolitan of the Greek church in Hungary, and of a Greek consistory and chapter. The only quarter of Carlovitz which has the appearance of a town is that part which adjoins the archiepiscopal palace; the larger portion of it stretches, like a lengthened regularly laid out village, along the banks of the Danube. It contains a cathedral, three churches, a Greek theological seminary, a lyceum in much repute, a Roman Catholic academy, and an hospital. The number of houses is about 500, and of inhabitants about 5900; in 1805 the population was 4841, and in 1815, 5797. The archbishop is the only Greek prelate of that rank in the Austrian dominions, and the whole of the Greek clergy within them are subject to his jurisdiction. The church of Mariafried on an adjacent eminence is built upon the spot on which the treaty of 1699, between Leopold II. and his Polish and Venetian allies and Mustapha II. of Turkey, was concluded. The traffic of the place is derived from its fisheries and transit trade, as well as the export of the wines, which the environs produce in considerable quantity; this has in some years amounted to 1,800,000 gallons. 45° 10′ N. lat., 20° 10′ E. long.

CARLOW, an inland county of the province of Leinster and diocese of Leighlin in Ireland, bounded on the E. and S.E. by the counties of Wicklow and Wexford, which separate it from the Irish Channel; on the S.W. and W. by the county of Kilkenny, and on the N.W. and N. by Queen's County and the county of Kildare. Its greatest length from N. to S. is 29 English miles; breadth, E. to W., 20½ do.; area, 346 square miles, or 211,410 statute acres: gross population, 1821, 78,952; in 1832, 81,649.

The county of Carlow (the smallest county, excepting Louth, in Ireland) is in form nearly triangular, the directions of the angles being N.N.E., W.S.W., and S. respectively. The whole county may be considered as an extension of the great central plain of Ireland, running S. to a point between the Wicklow and Wexford Mountains on the E., and the high grounds known as the ridge of Leinster on the W., and traversed in a direction nearly parallel to its E. side by the Barrow, which after cutting off the barony of Idrone West, changes its course from S. to S.S.E., and constitutes the W. boundary of the county, until it leaves it at its mearing with Kilkenny and Wexford. The Barrow has been made navigable through its whole course in Carlow, and affords the means of a considerable export trade to Carlow, the assize town, which is situated near this river's entrance into the county. The great S. road from Dublin to Kilkenny passes through Carlow in a direction nearly parallel to the Barrow, which it crosses at Leighlin Bridge. The roads, which are numerous and mostly in good repair, are kept up by county presentments, and, excepting the above line, have no turnpikes. A railroad has been projected nearly in the line of the chief S. road which connects Carlow with Dublin and Kilkenny. At present Carlow derives its chief facilities of transport from the Barrow navigation, which affords a water-carriage S. to Waterford, and N. by the Grand Canal, a branch of which meets it at Athy, to Dublin and the Shannon. The great plain, of which the county of Carlow may be considered as an extension, consists of limestone, which occurs along the basin of the Barrow and occupies the greater portion of the W. baronies. On the extreme W. of the county however the coal formation of the Castlecomer district occupies a segment near Old Leighlin, while the E. portion of the county is a field of granite, extending from the great granite chain of Wicklow and Wexford. A tongue of the old red sandstone formation of the Waterford Mountains is intruded between the limestone and granite, and crosses the bed of the Barrow about the point where it becomes the county boundary, striking N. towards Bagenalstown. In the limestone district the [illegible] is gravelly but warm: it is lighter and more peaty in the granite district. The limestone is dark, close-grained, and well adapted for the purposes of building; and the granite is celebrated for its whiteness, durability, and easy working under the hammer. From the facility also of splitting this stone with the wedge, lintels of granite are commonly employed in cases where bars of wood are used elsewhere, and a common fence in the county of Carlow is a granite paling, the square lintels resting on their angles in notches on the tops of granite uprights: the weight of the stone keeps it in its place without any further fastening, and its hardness renders it the most lasting of all inclosures.

With the advantages of a good soil and the most uniformly resident proprietary in Ireland (the rental of the proprietary is estimated at 130,080*l*. per annum), Carlow has long held a corresponding position as an agricultural and productive county. The crops generally raised are potatoes, wheat, barley, and oats, the proportion of each being pretty much in the order in which they are here enumerated. The usual rotation is potatoes succeeded by wheat; that again by oats or barley, with grass-seed and clover, to be kept for meadow and grazing, for a longer or shorter time as may be convenient to the holder. The system of farming in a great part of Carlow may be said to be good, particularly in the neighbourhood of Carlow, Leighlin Bridge, and Bagenalstown; and a decided improvement has latterly taken place throughout the county, that part of it bordering on Wexford and the lower part of Kilkenny being the most backward. In the first-named districts turnips and other green crops are freely cultivated, and the practice of ploughing in the second crop of clover is generally pursued. On the whole, the county is a rich one, and the farmers, whether on a large scale or not, are, for their stations, generally comfortable. The land is chiefly held in fee, averaging 15*s*. per acre to proprietors, and 40*s*. per acre to occupiers.

Carlow is divided into six baronies, viz., Rathvilly and Carlow on the N.; Forth, Idrone East, and Idrone West in the centre, and St. Mullins on the S. The chief towns are, in Carlow, Carlow, the assize town of the county; in Rathvilly, Tullow and Hacketstown; in Forth, Clonegal; in Idrone East, Leighlin Bridge, Bagenalstown, and Borris; in Idrone West, Old Leighlin. None of these are of any importance as towns, except Carlow; Leighlin Bridge however is a place of considerable interest to the antiquary, with a population of upwards of 2000; and Bagenalstown is likely to become one of the most flourishing villages in Ireland. The only corporate towns in the county are Carlow and Old Leighlin, which formerly returned two members to the Irish parliament. The latter place is now a hamlet of some twenty cabins.

The manufacture of coarse woollens was at one time carried on to some extent in Carlow, but the trade is now altogether gone, and neither linen nor cotton spinning has yet been introduced. The county is essentially an agricultural one, and its staple is the raising and manufacture of provisions—especially corn, butter, flour, and oatmeal. The export of corn from this county may be judged of by the tables given under BARROW. The export of butter from Carlow town alone has varied, within the last ten years, from 25,000 to 35,000 firkins, averaging 70 lbs. weight of butter each, to which may be added 10,000 firkins more for the remainder of the county, shipped annually by way of Waterford. On the Barrow navigation there is a fall of rather more than one foot per mile, which gives a great water-power, available for mill sites, at almost every weir; the number of corn-mills along the line is accordingly very great, and, with one or two exceptions, these establishments lie within the limits of this county. Corn-mills in Ireland are generally large edifices, and many of those in the county of Carlow belong to the first class of such buildings. Along the Carlow bank of the Barrow (with the above exception) it is calculated that not less than 200,000 barrels of wheat (producing 350,000 cwts. of flour, at an average price of 13*s*.) and 100,000 barrels of oats (producing 100,000 cwts. of oatmeal, at an average price of 11*s*.) are annually manufactured; an amount nearly double that effected by the same power ten years ago. The increase is chiefly owing to the great improvements in milling machinery which have taken place within that time. The provision trade consists chiefly in bacon for the home market. Large quantities of barley are malted by the resident maltsters and distillers. The value of the landed produce of Carlow has been estimated at 1,038,000*l*. per annum.

The first event of historical interest connected with this county took place A.D. 630, when a synod was held at Old Leighlin to adjust a dispute which had arisen between the Irish ecclesiastics and the see of Rome regarding the fit time of celebrating Easter. Of this discussion the life of St. Munnu, quoted by Ware, furnishes the following characteristic anecdote:—'Laserian, abbot of Leighlin, who presided over 1500 monks, defended the new (*i. e.* the Roman) order: while others adhered to the antient (*i. e.* the Irish) form. * * * Then St. Munnu (Laserian's opponent) said—"You have three options given you, O Laserian: let two books, one of the old order and another of the new, be cast into the fire, and let us see which of them shall escape from the flames. Or let two monks, one of yours and another of mine, be shut up in the same house, and let the house be set on fire, and we shall see which of them shall escape unhurt. Or let us both go to the sepulchre of a dead monk and raise him up to life, and he will show us which order we ought to observe in the celebration of

Easter." To which Laserian answered—"We will not proceed to judgment with you; because we know that if you commanded *Mount-Marge* (*Slieumargy*, near Carlow) to be changed into the *White-Field* (Leighlin), and the *White-Field* to be removed to the place where *Mount-Marge* now stands, that on account of your infinite labours and great sanctity God would immediately do this for your sake." Afterwards the people returned every one to their own homes.' The synod ended by decreeing a deputation to Rome, where after diligent inquiry the Irish ecclesiastics became satisfied of the correctness of the Roman computation, and, returning, introduced it universally in Ireland. The civil history of the county up to the arrival of the English possesses little or no interest. On the arrival of the English this part of the country was known as comprehending the territories of Hy-Drone and Hy-Cavanagh, being the northern portion of the territory of Hy-Kinsellagh, the patrimony of Dermot Mac Murrogh, king of Leinster, the inviter of Strongbow. Isabel, daughter of Strongbow by Eva, daughter of Dermot, married (1189) William Earl Marshal, one of the invading nobles, who in her right succeeded to the principality of Leinster. This William, who was Lord Justice of Ireland, granted the first charter to the inhabitants of Catherlagh, as the present county town was then called, about 1208; and King John coming to Ireland in 1216 made the county shire ground. William Earl Marshal and Pembroke dying in 1219 left five sons and five daughters, and on failure of the male line his immense estates devolved upon the latter, viz., to Maud, who married Roger Bigod Earl of Norfolk, Carlow; to Joan, who married Warren Lord Montchesney, Wexford; to Isabella, who married Gilbert Earl of Gloucester, Kilkenny; to Sibilla, who married William Earl Ferrers and Darby, Kildare; and to Eva, who married William de Breos Lord of Brecknock, Leix, part of the present Queen's County; which great partition was made between the co-heiresses at Woodstock on the 3rd May, 31st Henry III. From Roger Earl of Norfolk the lordship of Carlow passed to the crown, and from Maud his wife the barony of Idrone passed by grant in fee to the family of Carew. The lordship of the county was next granted by Edward I. to Thomas de Brotherton, and from him descended through the family of Howard, earls of Norfolk and lords of Carlow, till forfeited by the statute of absentees in the reign of Henry VIII. These lords palatine are thus described by Sir John Davies: 'These absolute palatines did make barons and knights, did exercise high justice in all points within their territories, erected courts for criminal and civil causes, and for their own revenues, in the same form as the king's courts were established in Dublin; made their own judges, seneschalls, sheriffs, coroners, or escheators; so that the king's writ did not run in these counties, but only in the church lands lying within the same, which were called the cross, wherein the king made a sheriff; and so in each of these counties palatinate there were two sheriffs, one of the liberty and one of the cross.' But these lords residing at a distance gradually slackened the exercise of their privileges, and the descendants of the dispossessed Irish taking advantage of the lax administration of their deputies, and headed by one of the Kavanaghs, a descendant of Dermot Mac Murrogh, began forcibly to repossess themselves of their antient patrimony, in which attempt they were ultimately so successful that in the 37th Edward III. an order issued *pro barrio amovendo a Catherlogh usque ad Dublin*—for withdrawing the boundary of the pale from Carlow to Dublin—the country S. of Naas having fallen completely into the hands of the Irish. Richard II., A.D. 1394, and again in 1399, undertook expeditions* for the recovery of the revolted counties, but although he forced some of the Irish chieftains to a temporary show of obedience, he was finally obliged to return to England without accomplishing his object. The whole county, including Carlow town and castle, seems to have remained in the hands of the Kavanaghs and other native chiefs till 1494, when the Fitzgeralds seized the castle, which they held till after the unsuccessful rebellion of Lord Thomas Fitzgerald in 1537. In this year the resumption of the lordship of Carlow, alluded to above, took place; by which means the crown was afterwards enabled to grant large estates to the family of Butler in this county. In 1567 Sir Peter Carew, descendant of the last proprietor of Idrone, into which the Kavanaghs had forcibly intruded in the reign of Edward III., exhibited his claim to this barony; and having established it to the satisfaction of the council, entered on possession, and 'dealt in such good order with the Kavanaghs, and so honourably used himself, that they all voluntarily yielded up their lands, and submitted themselves to his devotion.' (Hooker.) He appears to have been a great benefactor to this part of the country, having divided the barony into manors, and established manor-courts for determining causes according to the English law, keeping a strong force at Leighlin Bridge, where he was celebrated for his splendid hospitality, and overawing while he conciliated his turbulent neighbours. Sir Peter Carew died 1576, and his son Sir Peter Carew was killed at Glendalogh in a battle with the O'Byrnes of Wicklow in 1580, after which the Kavanaghs once more made head in Carlow, and Donnell Spaniagh (the Spaniard), their leader, joining with Feagh Mac Hugh, chief of the O'Byrnes, commenced a predatory warfare, which lasted from 1590 till 1601, when Sir Oliver Lambart at length reduced both to submission. During this insurrection Kavanagh had upwards of 1000 men of his own name in the field; and after his submission furnished a small force of his own people against Tyrone, in aid of whose great rebellion he had originally risen in arms.

During the reign of Elizabeth large tracts of the county of Carlow had been granted to the Butlers and Fitzgeralds, and in the succeeding reign their estates were confirmed, as well as considerable possessions to the Earl of Thomond, to the submitted Kavanaghs, and among other grants was that of the entire barony of Idrone, which seems to have escheated, on Sir Peter Carew's death, to the family of Bagnall. The forfeitures consequent on the different wars up to 1690 did not make any very material change in the distribution of property, the attainted proprietors in this county being few in number. Dudley Bagnall, Esq., was the chief sufferer, and the distribution of his estates, with those of John Warren, Esq., John Baggot, Esq., and Lord Galmoy, introduced a few new names, still of great respectability, into the county. The total amount of forfeitures in 1688 was 26,303 Irish acres, valued at that time at 7913*l.* 11*s.* 6*d.* per annum. In the rebellion of 1798 Carlow was the scene of several engagements. On the 25th May the rebels attacked the town of Carlow, and were repulsed with the loss of 600 men; on the same day a battle was fought at Hacketstown, in which the insurgents, said to have been 13,000 strong, were defeated with considerable loss; and, on the night preceding, Borris House, the residence of Mr. Kavanagh, was attacked by 5000 of the peasantry, who were repulsed both on this occasion and on the 24th June when they assailed the town of Borris. Leighlin Bridge and Bagenalstown were also attacked with a like success. The amount of compensation claimed for losses sustained in this rebellion by the county was 24,854*l.* 14*s.* 7*d.* The county has, during the earlier part of the present century, enjoyed the advantages of resident landlords and an attached peasantry, but of late years society has been much torn by dissensions both civil and religious.

The chief antiquities of the county are military; cromlechs, near the towns of Carlow and Hacketstown, and the cathedral church at Old Leighlin, being the only pagan and ecclesiastical monuments of interest. Of the cromlechs that near Carlow is the most remarkable: the covering-stone here weighs nearly 90 tons. Of the castles those at Carlow, Tullow, and Leighlin Bridge, are the most antient: the building of all is attributed to De Lacey. At Clonmullin, in the barony of Forth, are some traces of the castle of Donnell Spaniagh Kavanagh; Cloghgrenan, a castle of the Butlers on the right bank of the Barrow, is still standing. Clonmore, another stronghold of the same family, situated near Hacketstown, remains in a state of good preservation; it is a noble pile of 170 feet square, flanked with square towers at the angles.

In 1821 the number of young persons receiving instruction in this county was 7059; in 1824 there were 165 schools, educating 8461 scholars, of whom 7000 were Roman Catholics, and 1460 were Protestants.

The county expenses are levied by annual grand jury assessments. The only public institutions for charitable purposes are a lunatic asylum, fever hospital, and infirmary at Carlow, dispensaries at seven other towns throughout the county, and fever hospitals at Tullow and Bagenalstown. Poverty does not assume the same dreadful form here as in many other counties of Ireland; still it would appear, from the reports on the state of the Irish poor, that although the more distressed classes in Carlow neither emigrate periodically to England, nor willingly betake themselves to open begging, there is a great amount of suffering among the labouring peasantry during the winter months and from June to August annually. Women of loose character are scarcely known in the country parts, and persons of illegitimate birth labour under considerable odium.

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* The proceedings of the English army in the last expedition are minutely detailed in the MS. of De la Marque, who accompanied the king on the occasion. The MS. has been translated and published in the 'Archæologia.'

In 1831 the population consisted of 41,839 males, and 81,988 females, total 81,988 persons, constituting 14,609 families, of which 8163 were employed chiefly in agriculture, 2581 were engaged in trade, manufactures, and handicraft (56 individuals being employed in machine making), and 3865 not included in either class. Number of houses inhabited, 13,275; uninhabited, 395; building, 109; total, 13,779; do., in 1832, 13,906; do., in 1821, 13,028.

Carlow county returns two members to the imperial parliament, and supports two newspapers, both published in the county town, which returns one member.

The history and antiquities of the county have lately been illustrated in a work on that subject by Mr. Ryan, which furnishes all the historical facts of importance. For statistical and geographical details see *Stat. Survey of the County of Carlow*; *Parliamentary Papers and Reports*; *Trans. Geolog. Society*, vol. v. This portion however of the present notice is chiefly derived from actual observation.

CARLOW, the assize town of the county of Carlow, situated in the parish and barony of the same name, 50 English miles S.S.W. from Dublin. The boundaries of the antient borough, including only that portion of the town which stands upon the left bank of the Barrow, have been extended by the 2d and 3rd Will. IV., c. 89, and now embrace the suburb of Graigue, in the Queen's County, on the right bank of the river; the extent of the antient borough is 382 statute acres, and that of the additional portion 114 acres, with a total population of 10,612 persons.

The town of Carlow grew up round the castle which was founded here by the early English conquerors about the end of the twelfth century. It was erected into a borough by William Earl Marshal about 1208, and was surrounded with walls in 1362 by Lionel Duke of Clarence, who removed the king's exchequer hither from Dublin. Down to the revolution of 1688 the history of the castle is that of the town. It is said that the castle was seized in 1297 by Donnell Mac Art Kavanagh: and it appears to have been occasionally in the hands of the Irish till about 1494, when it was seized by a brother of the earl of Kildare, and after a siege of ten days was taken from him by the lord deputy Sir Edward Poynings. During Tyrone's rebellion Carlow castle was held by the queen's wardens; and, in the wars subsequent to the rebellion of 1641, was ineffectually besieged by the Irish (April, 1642). It was next occupied by the royalists under Captain Bellew, and on the 24th July, 1650, after a short siege, was surrendered to Sir Hardress Waller, commanding a division of Ireton's parliamentary forces. In July, 1604, the manor of Carlow was granted to Donogh O'Brien earl of Thomond, and the office of constable of the castle was bestowed on him and his son Brian in consideration of his surrender of certain castles in Tipperary and Limerick. In 1614 the castle and town of Carlow were granted to Sir Charles Wilmot, knt., at an annual rent of 6*s.* 8*d.*; and, in 1613, James I. granted a charter to the inhabitants of Carlow, constituting the town a borough, to be governed by portreeve and burgesses. This charter was confirmed by the 26th Charles II., which constitutes the borough a corporation consisting of sovereign, burgesses, and commonalty, and is the governing charter of the town at present. The most remarkable object of antiquity in Carlow is the castle now in ruins. Its dilapidation has been comparatively recent. The whole structure, a square of 105 feet, with massive round towers at the angles, was standing in 1814, when an injudicious attempt was made to modernize it by piercing new windows and diminishing the thickness of the walls, in consequence of which more than one-half of the building fell to the ground. Its ruins, consisting of one curtain wall with its flanking towers, about 65 feet in height, stand over the left bank of the Barrow, and still form a prominent and picturesque object. Under the south side of these ruins the Burrin, a small river flowing westward from of Forth, enters the Barrow nearly at right

The town consists chiefly of two main streets, one nearly parallel with the Barrow, and crossing the Burrin by a neat metal bridge; the other at right angles leading to the suburb of Graigue, in the Qu by a handsome balustraded stone bridge over t mediately north of the castle. Over again ies on the north side of the latter street, stands the pari church, a respectable edifice ornamented with a spire of ne elegant proportions, erected in 1834 at an expense of 180 At the intersection of the main streets is the l court-house, now shut up since the opening of the nev building at the entrance of the town on the northern side. court-house is an octagonal building of cut sto handsome portico of Ionic columns, approached by a fine flight of steps, and elevated on a massive balustraded basement: it forms a very ornamental termination to the main street which here diverges, the eastern branch leading to the Dublin road, the western towards the Lunatic Asylum, and villas of the gentry situated along that bank of the Barrow. The Roman Catholic church and college stand on the eastern outskirts of the town, and are both fine buildings; the former, adorned with a lofty and highly ornamented octagonal tower, was consecrated in 1834, and cost 18,000*l.*; the latter, a plain but extensive edifice, was originally founded in 1789 for the education of lay and ecclesiastical Roman Catholics. A new wing was added in 1828, and the house is now calculated for 200 students. This building cost 13,000*l.* There is also a Roman Catholic convent here, founded 1811, with a school (now in connexion with the national board) attached, which cost 2600*l.* The late Dr. Doyle, Roman Catholic bishop of Kildare and Leighlin, was the chief promoter of these foundations. The county gaol, to which large additions were made in 1832, stands on the south side, and is a well-regulated establishment, where employment is provided for prisoners of both sexes. Here is a barrack for two companies of infantry and a troop of horse. The town is not lighted, and there is no public supply of water, which is procured from the rivers and by private pumps. Coal is brought from the neighbouring coal district in the Queen's County, and by the Barrow from Ross and Waterford; but the principal fuel used by the lower class is turf, which is procured from the borders of the adjoining county of Kildare. The chief manufacture carried on here is that of flour and oatmeal, large grinding mills being driven both by the Burrin and Barrow; there are two breweries and one distillery, and a considerable quantity of barley is malted in the town. The butter trade is carried on extensively, and the brand of Mr. Samuel Haughton, the chief exporter of this article from Carlow, bears the highest character among Irish butters in the English market.

In 1821 the population of that part of Carlow in the county of Carlow was 8035, and in 1831, 9114, viz. 4268 males, and 4846 females, forming 2005 families, of which 96 were chiefly engaged in agriculture, 824 in trade, manufactures and handicraft, and 1085 not included in either denomination. Houses inhabited, 1351, building, 11; unoccupied, 136, to which may be added 1600 persons and 146 houses for Graigue: 516 houses of the total number were thatched.

In 1824 there were in Carlow 15 Roman Catholic and 12 Protestant schools, educating 1035 males and 662 females; and in 1834 there were on the books of the various schools 876 males and 743 females. The number of students at present in the college is 163, mostly ecclesiastical, who pay 25*l.* per annum each; lay students pay 34*l.* 2*s.* 6*d.* Of the national schools one educates 200 males, and the other 269 females, both in connexion with the Roman Catholic convent. Here is a Protestant free-school with a soup-kitchen for the poor attached; the number of pupils is from 200 to 250. Under the same roof are the apartments of an industrious association for bettering the condition of the female peasantry, of a Protestant orphan society, and of a Protestant benevolent society for clothing.

The lunatic asylum for the counties of Carlow, Kildare, Wexford, Kilkenny, and Kilkenny city, which is half a mile north of the town, was opened in 1831; it cost 22,552*l.* 10*s.* 4*d.*, is calculated to accommodate 106 patients, and is supported at an expense of about 2000*l.* per annum. In 1833 there were 40 patients, and in 1836, 122.

Carlow is a neat and thriving town, situated in a rich country, and is the residence of many re ble individuals. (Ryan's *History of the County of Car* *Parliamentary Reports and Papers*; *Original Communications*.)

CARLSBAD, a royal town, celebr for its mineral waters, and built on both banks of the is in the circle of Ell [illegible] mis. The warm spring to which it is indebte [illegible] its celebrity appears to have been well known even in [illegible] seventh century, by the name of Tepliwody, for the Bohemians of that day constructed altars to their divinities out of the stones over which the spring made its way. It did not attract much attention until the year 1370, when Charles IV. and his attendants, as the tradition says, while following the chace in its vicinity, having hunted a stag to the edge of a precipice, drove the animal down it; one of the hounds that leapt after the prey finding himself immersed in a concealed spring instead of alighting on firm ground, set up so pitiful a howl that some of the huntsmen came to his assistance. Charles's body-physician, Beier, was one of the party, and formed so high an opinion of the virtues of the water, that he recommended his royal master to use it for the cure of some ailment under which he laboured. The result having established its efficacy, Charles founded a free town on the spot, settled the inhabitants of a neighbouring village upon it, ordered baths to be opened, and gave his own name to them.

Carlsbad is in a deep narrow valley, and contains about 500 houses; the resident inhabitants are nearly 3000 in number. The valley is traversed by the Tepl, which falls into the Eger just below the town, and is bounded on every side by lofty heights of granite. The houses branch out into three distinct ravines or lesser valleys, which are under the brow of the Hummerberg, Kreuzberg, and Lorenzberg. A more delightful scene cannot be conceived than the prospects from the summit of these heights, particularly the Kreuzberg. The hot springs, which are close to the banks of the Tepl, consist of the Sprudel, near which are some salt-works; the Hygeia Well; the Schloss-Spring, which disappeared in 1809 and returned in 1823; and the New, Mill, Bernhard, Theresia, and Spital Wells. They emit a delicate vapour, which constantly hangs over the town, and has a peculiar odour. The whole of the springs have been estimated to yield about 128,212 eimer (1,923,180 gallons) in the 24 hours, of which 1,669,300 flow from the Sprudel and Hygeia springs alone. There are vapour and other baths. The Wiesen Street, a small row of houses, lines the banks of the Tepl; and on a line with it are two sets of assembly rooms, as well as the Puppische Allée, a promenade of lime and chestnut trees, under which stands are erected for the sale of millinery, fancy articles, &c. The church, townhall, theatre, assembly rooms, hospital, and market-place are the chief buildings. On the left bank of the Tepl are what are called the Old and New Meadows, forming a handsome terrace, lined with well-built houses, ornamented with a theatre, and planted with trees. The vicinity of Carlsbad abounds in pleasant walks and drives. The visitors have increased from 256 to upwards of 2000, on the average, annually since the year 1764; in some seasons there have been 4000. An hospital, into which about 130 strangers are yearly admitted, was founded here in 1812. There are manufactories of needles, cutlery, hardware, arms, &c. 50° 13′ N. lat., 12° 52′ E. long.

CARLSKRONA, a town in Sweden, in the province of Blekinge or Carlskrona Län, 56° 10′ N. lat., and 15° 30′ E. long. It is built on a small island and a few adjacent rocks, and united to the main land by a long bridge, which unites three rocks, lying one behind the other, between the town and the continent, and may therefore be considered as one very long bridge. Its streets are wide and straight, but the ground on which the town stands is uneven. The houses are commonly good, though small; many of them are built of stone and the rest of wood.

This town is the station of the Swedish navy. The harbour, formed by a series of islands lying about three miles distant from the continent, is spacious, safe, and convenient, and has depth enough for the largest men-of-war. There are three entrances. The principal entrance opens to the S. opposite the town, between the islands Aspö and Tjurkö, on which strong fortifications have been erected to defend the port. This is the only entrance that is practicable for the larger vessels. The entrance to the W. of it is called Aspösund, and may be entered by frigates, and still smaller vessels find admission into the harbour by the E. entrance, called Skällesund.

The dry docks of this harbour have always attracted the attention of foreigners. The old dock, built in the beginning of the last century, is cut in a hard rock, and is 200 feet long by 80 feet wide: it is deep enough for the largest vessels. The new dock is much more extensive, and consists of several divisions for the building of different kinds of vessels; it is likewise cut in hard rock, and was made towards the end of the last century. The other buildings are the arsenal, the artillery-yard, and the admiralty. The greatest inconvenience to which the inhabitants are exposed is the want of good water; that which is drawn from the wells in the town is brackish, and the poorer classes, who use it, are subject to putrid fevers in summer: good water is brought from a distance of more than four miles. Carlskrona is the seat of the governor of the province, and contains about 12,500 inhabitants: its commerce is unimportant. (Schubert's *Travels*.)

CARLSRUHE, the capital of the grand duchy of Baden and residence of the grand duke, is in the circle of the Middle Rhine, and lies about four miles E. of the Rhine and about 13 from the edge of the Black Forest. It stands at an elevation of 372 feet above the level of the sea and 50 feet above that of the Rhine. Its origin was a hunting-seat built on the spot by Charles William, Margrave of Baden, 118 years ago. It is constructed in the form of an extended fan, the present palace constituting the central point, from which 32 avenues diverge: hitherto 11 only of these avenues have been lined with rows of houses, which form the main streets of which the town at present consists. Some of them are spread into the beautiful forest of Hart, which is situated to the N. and W. of Carlsruhe; on the other side, gardens, fields, and meadows encircle the town. The streets commence from a semicircular row of handsome houses with arcades to them, which fronts the palace and is called the Great Circle. The whole area which the town occupies is 300 acres. One side is open, another walled in, and a third pallisaded; it is entered by seven gates: the entire number of streets is 33; they are broad, and furnished with foot-pavements. The long street, which runs from E. to W., and the palace street, which traverses from N. to S., divide Carlsruhe into four districts. What is denominated the Leaden Tower (Bleithurm) stands in the centre of the palace, and is in fact the centre of the whole elevation on which the town is built; the right wing of this edifice contains the public library (about 70,000 volumes), a collection of antiques and coins, &c.; and the left wing, the church of the court. The open space in front is ornamented with quadruple rows of trees on each side, disposed in two oblong squares, with basins of water in the middle. The great circle contains the government offices, as well as the spacious palace of Margrave Maximilian.

Carlsruhe has nine public squares, the finest of which is the market-place, in length 180 feet and in breadth varying from 50 to 70; it is skirted by handsome houses, four stories high, which rest on arcades. A stone pyramid, with an inscription in memory of Charles William, the founder of the place, whose remains are inclosed in it, stands in the centre of the square. The style of the houses is various; some are in the Dutch, others in the French, and many in a mixed Greek and Roman, which last is that now in vogue. Opposite the palace stand the government buildings, connected by an arcade; on one side of them are the orangery and offices for the grand ducal gardens, and on the other the riding-school and grand ducal stables and offices. The churches consist of the new Protestant church, a very handsome edifice, commenced in 1807, and decorated with a fine altar-piece of the Ascension and painted sides to the galleries—beneath the church is a long range of vaults for the interment of the grand ducal family; the new Catholic church, a modern structure also, built in the shape of a cross, with an elegant tower and portico; and lastly the garrison church, in the French style of the last century: a very handsome synagogue in the Eastern style has also been erected. The town-hall was commenced in 1821, in which year also the building for the legislative assembly was finished; it is three stories high and contains two fine halls for the sittings of the two chambers, besides residences for the president, officers, &c., and depositories for the archives and papers. There are also the palaces of the Margravines Amalia and Frederica, and of the Prince of Fürstenberg and Count Bismerk; the museum; the mint and offices of works; the academy of the arts and sciences with a picture-gallery attached to it; the arsenal, foundry for cannon, military teachers' and polytechnic schools, lyceum, post-office, and barracks. Altogether Carlsruhe contains above 1200 buildings, of which 90 are public, independently of 14 palaces and 1100 private dwellings. It possesses a botanical garden, a veterinary school, four hospitals, a deaf and dumb asylum, a bible-society, an association for promoting national industry, a Jewish society for encouraging agricultural pursuits among the Jews, and other useful and benevolent institutions.

The population of Carlsruhe is greatly on the increase. It consisted of 15,789 souls in the year 1816, and at present exceeds 20,000, inclusive of the military and strangers. In 1828 their numbers were 19,718, of whom 12,906 were Protestants, 5803 Roman Catholics, and 1009 Jews. At this time the males amounted to 10,135 and the females to 9583. The inhabitants derive their livelihood principally from trade, mechanical employments, and manufactures, and the natural expenditure arising from Carlsruhe being the seat of government for the grand duchy. The cultivation of grain, fruit, vegetables, and hemp, is a secondary means of subsistence. In 1833 there were upwards of 1000 persons employed as mechanics and in connexion with trade, besides 2000 labourers, &c. The chief manufactures are silks, cottons, carpets, woollens, jewellery, tobacco, leather, and articles of luxury. The consumption of animal food in 1836, when the population was below 19,000, amounted to 2304 bullocks, 718 cows, 1740 heifers, 10,521 calves, 1575 sheep, 5730 swine, and 22 goats.

In and about the town there is a variety of public and private gardens and grounds open for the amusement of visitors, particularly the Palace Gardens, containing 70 acres, the Pleasants' Garden, 360 acres in extent, the Botanical Garden, which is the third as to value in Germany, &c.: collections in the arts and sciences are also numerous. The English plantation (*Englische Anlage*) leads to the baths of Beiertheim, beyond which is the hunting-seat of Scheidenhard; and there are a number of attractive spots in other directions. Carlsruhe is in 48° 56′ N. lat., and 8° 22′ E. long.

CARLSTADT, (in Hungarian Latin, Carolostadium, and in Sclavonian, Karloveez,) the capital of the circle, called the *Carlstadter-kreis*, in the southern part of the Austrian province of Agram in Hungary. It stands at an elevation of about 894 feet above the sea, in a picturesque situation on the banks of the Kulpa, and at the confluence of that river with the Korana and Mresnicza. It has long been a royal free town, and has a fortress, constructed by the Archduke Charles of Styria, in 1579, though in the present day it is less important in a military than in a commercial point of view. The town is not ill-built, although the houses are mostly of wood; it consists of the inner town, the fortress, and Dubovacz, a suburb. The fortress, originally designed as a bulwark against the inroads of the Turks, is encompassed by ramparts, a ditch, and pallisadoes, and though on a small scale, has a handsome parade, on which there are barracks and an arsenal. Besides 5 Roman Catholic, a Greek church, and a Franciscan monastery, the oriental Christians, about 170 individuals in number, possess a place of worship here. It is the residence also of a Greek bishop; and has a gymnasium, conducted by Franciscans, and a head school, as well as one for females. The population, including the suburb and fortress, is about 6300; at the close of 1804 it did not exceed 4200. There are few mechanics or manufacturers in the place. It has a distillery, builds small craft, and carries on an extensive transit-trade between the ports on the Adriatic and Lower Hungary and Sclavonia. It is in 45° 29′ N. lat., 15° 37′ E. long.

CARMAGNO′LA, FRANCESCO BUSSO′NE DI, Count of Castelnuovo, was born at Carmagnola, a town of the province of Turin in Piedmont, about the year 1390, of humble parents. Early in life he enlisted into the troop of Facino Cane, a celebrated Condottiere of his time, who was in the service of the Visconti, Dukes of Milan. As he rose in rank he took the name of Carmagnola, from the place of his birth. After the death of Facino, Filippo Maria Visconti made Carmagnola his general in chief, as a reward for his bravery and services. Carmagnola was chiefly instrumental in placing Filippo Maria on the ducal throne of Milan, and he afterwards added to his dominions Piacenza, Brescia, Bergamo, and other towns. Filippo Maria created him Count of Castelnuovo, gave him in marriage his relative Antonietta Visconti, and sent him to Genoa as governor. In 1424 Filippo Maria, who was of a dark suspicious temper, having listened to the unfavourable reports of some courtiers around him, ordered Carmagnola to be deprived of his military command, upon which the latter repaired to the duke to remonstrate with him; but being denied an audience, he rode off with a few trusty companions, left the territory of Milan, and after some wanderings repaired to Treviso, in the Venetian territory, where the duke sent an assassin to murder him, but the plot failed. He then went to Venice, where he arrived in February, 1425.

The Venetian senate having declared war against the duke, in January, 1426, appointed Carmagnola their captain-general. Carmagnola defeated the duke's troops and took from him the province of Brescia, which was from that time incorporated with the Venetian state. In 1427 he defeated again, near Maclodio, the duke's troops, which were led by Sforza, Pergola, Piccinino, and Torello, all celebrated Condottieri of that time. After the battle, Carmagnola's soldiers, who were chiefly mercenaries, liberated all their prisoners, according to the custom then prevalent among the Italian Condottieri; the reason of which was, that as those troops fought merely for pay, they did not wish utterly to destroy their antagonists, for fear that the war should come to an end too soon. The Venetian commissaries, who accompanied the army, remonstrated with Carmagnola upon this occasion, but that chief asserted the usage and privilege of his soldiers.

In 1428 peace was made between Venice and the duke, but in 1431 war broke out again, and Carmagnola, retaining the command of the Venetian army, attacked the castle of Soncino, but failed after a considerable loss. Shortly after, in July of the same year, the duke's flotilla on the Po defeated that of Venice, in sight of Carmagnola's camp, who was not in time to support it. That commander was accused of neglect and even suspected of treachery. The senate wrote him a letter of reproof, but continued him in command. In the following October Carmagnola attempted to surprise Cremona; part of his men entered the town, but the citizens rising in a mass, drove out the assailants. This failure increased the suspicions and fears of the Venetian senators, who determined to deprive Carmagnola of his command, but fearing to attempt it while he was in the midst of his soldiers, by whom he was beloved, they invited him by courteous letters to repair to Venice in order that they might consult with him on the peace to be made with the duke. Carmagnola went to Venice, where he was received with marked distinction, and was led immediately to the ducal palace. Being introduced into the hall of the Council of Ten, he was all at once charged with treason, arrested, taken to the adjoining prison, examined secretly, put to the torture, and condemned to death. On the 5th May, 1432, he was led out, with his mouth gagged, to the Piazzetta of St. Mark, and there beheaded between the two pillars. His property was confiscated to the state. Concerning the guilt or innocence of this celebrated commander much diversity of opinion prevails. Manzoni, a living Italian writer, in his 'Notizie Storiche,' which accompany his drama 'Il Conte di Carmagnola,' has fully examined the question and referred to the authorities on both sides.

CARMEL, MOUNT. In its most restricted sense this name is applied to a mountain about 1500 feet high, forming the southern promontory or cape of the Bay of Acre. More largely, it is applied to the chain of hills to which that mountain belongs, and the extent of which is variously stated at from six or eight to twelve or fourteen miles. This uncertainty seems to proceed from the range having no very marked termination, the whole being, in fact, merely the terminating portion of the large range which extends about a hundred miles from Point Carmel, southward, to below Hebron, in its course intersecting the country about midway between the Jordan and the sea. Carmel seems to be sometimes understood in this large sense in Scripture, as we find the name applied to mountains within the territory of Judah, the most southern tribe. (Josh. xv. 55; 1 Sam. xxv. 2; and 2 Sam. iii. 3.) The north-western portion of this range, to which the name of Mount Carmel is more usually given, slopes down to the sea on one side, and to the Bay of Acre on the other: but in its extension south-eastward, a small plain intervenes between it and the sea on the west; while the river Kishon winds along its eastern base, beyond which opens the great plain of Esdraelon. The mountain is described as rocky, composed of a whitish stone, in which flints are embedded. On the summits of this short range, oaks, pines, and other trees grow; and the vines and olive trees which are still seen among the brambles indicate that its surface was once under cultivation. The sides are still covered with rich pasture, where shepherds feed their flocks as they did when the Hebrew prophets described it as the 'habitation of shepherds.'

Carmel contains numerous caves, particularly on the western side. The largest of these, according to tradition, was occupied by the prophet Elijah, the most remarkable events of whose history are connected with Mount Carmel. On the summit there is a monastery belonging to the Carmelite monks, who took their denomination from this mountain. The site of the monastery is believed to be the spot on which Elijah offered sacrifice. It was never a fine building, and although in tolerable repair has been deserted for many years, the single monk who has the care of it residing in the town of Caipha at the foot of the mountain.

CARMINATIVES, agents chiefly obtained from the vegetable kingdom, are employed to promote the expulsion of flatulence. Though gases of different kinds are occasionally secreted by the inner surface of several organs of the body, those gases which infest the intestinal canal are in a great measure the result of the fermentation of articles of food, the digestion of which is slow or imperfect. Whatever causes indigestion favours the formation of such gases; hence they mostly trouble infants, whose stomachs are generally feeble, or hypochondriacal and hysterical individuals, or those who lead a sedentary life. Substances which impart, even for a very short time, that energy and power which, in such persons, the stomach and intestines appear to be destitute of, enable them to throw off the wind which oppresses these organs. Plants possessed of an aromatic principle, owing to the presence of a volatile oil, are employed to effect this end, which they sometimes accomplish even when applied to the external surface of the stomach, and much more certainly when taken internally. Instead of the plants in a raw or dried state, the oil is often extracted from them by distillation, or a tincture or even a distilled water is formed from them, and administered under similar circumstances; and this last mode is in general the best. A few drops of the oil, or of the tincture of any of these plants, may be dropped upon sugar, and so introduced into the stomach, or the distilled water may be made the vehicle for the administration of other medicines proper to be given at the same time. Thus some alkaline earth, such as magnesia or its carbonate, or a pure alkali, such as liquor potassæ, or an alkaline carbonate, may be given at the same time with good effect.

As a general rule, it may be stated that if these stimulants fail on their first exhibition to give the relief expected, they should not be repeated without the sanction and advice of a competent medical attendant; for, even if an inflammatory condition of the stomach and intestines do not already exist, the continuance of colicky pains is apt to produce it, especially if assisted by brandy or other stimulants. Even dill or anise may affect too powerfully the sensitive nervous system of infants, for these are by no means such simple agents as is commonly supposed: the seeds of dill poison bullfinches, canary birds are killed by those of anise, and parrots by those of parsley.

The safest and most effectual means of avoiding the distressing symptoms attendant on the disengagement of flatus are great attention to diet and regimen. Regular exercise should be taken daily. The food should be plain; soups and much liquid, particularly tea, should be avoided; and the person should retire to rest at an early hour. [AROMATICS, ANTISPASMODICS.]

CARMINE, one of the most beautiful of the red colours used by painters. It is obtained from cochineal by the following process:—Boil 12 lbs. of filtered rain-water in a tin vessel, and add to it 4 ounces of finely-powdered cochineal; boil for five minutes, constantly stirring with a glass rod; then add 5 scruples of alum in fine powder, and perfectly free from iron; boil again for two minutes, remove the vessel from the fire, cover it, and allow the contents to settle. As soon as the liquor is clear, pour it while still hot into glass or porcelain vessels, and suffer it to remain for some days, covered from the dust. The alum gradually precipitates the colouring matter, in combination with animal matter and a little alumina; this last however is not essential to the colour. The precipitate is put on a filter, washed, and dried in the shade.

These directions are taken from Berzelius's 'Traité de Chimie,' t. vii. p. 676. He states also that some other kinds of carmine are prepared from cochineal.

The colouring matter of carmine may be extracted by ammonia, and the best is almost entirely soluble in this alkali, leaving only a little alumina: this colouring matter has been called *carmin*, for an account of which, and some other properties of cochineal, see COCHINEAL.

CARNAC, a village or small town in France, in the department of Morbihan, not far from Auray, remarkable only for the remains of an extensive Celtic monument, of which we subjoin a description from Mrs. Stothard's *Letters written during a Tour in Normandy and Brittany*, London, 1820, 4to., p. 256 et seq.:—

'We hired a cabriolet, and left Auray early this morning; besides the driver, a man accompanied us, who walked by the side of the voiture, in order to render his assistance in preventing it from being upset by the large, loose, and broken rocks that strewed the way, and lie in confused heaps about the road. After travelling three leagues through a desolate and wild country, we arrived at a spot about a mile from the sea-shore, where this curious Celtic antiquity remains, a monument at once of the power and insufficiency of man, for his own stupendous work has long outlived all memory of its founder or its history. Carnac is infinitely more extensive than Stonehenge, but of ruder formation; the stones are much broken, fallen down, and displaced; they consist of eleven rows of unwrought pieces of rock or stone, merely set up on end in the earth, without any pieces crossing them at top. These stones are of great thickness, but not exceeding nine or twelve feet in height; there may be some few fifteen feet. The rows are placed from fifteen to eighteen paces from each other, extending in length (taking rather a semicircular direction) above half a mile, on unequal ground, and towards one end upon a hilly site. The semicircular direction was probably accidental, as from their situation it was not possible to see all the ground at once, in order to range them in a straight line. When the length of these rows is considered, there must have been nearly 300 stones in each, and there are eleven rows; this will give you some idea of the immensity of the work, and the labour such a construction required. It is said that there are above 4000 stones now remaining. We remarked three tumuli, probably the graves of chiefs; they are formed of large stones placed upon each other, on a raised bed of earth. In some places the irregular line of the work is broken by the ground having been cleared for fields: in others, the stones that have fallen were broken up and carried away for building. More injury has perhaps been done to this stupendous Celtic work by the hand of man than by that of time. The place was peculiarly well chosen for obtaining materials to construct such a monument, as the ground for miles round is full of rock. We could gain no information from the people relative to anything that might have been found: for in answer to whatever we said to the peasantry, we received replies in the Breton tongue, of which we could only articulately distinguish the word *Gaelic*, and this was repeated whenever we accosted them. I have been informed by a priest, but I know not how far it may be correct, that *Carnac* signifies literally, in the Breton language, *a field of flesh*.* If this be the meaning of the word, it would lead one to conjecture that these stones were placed in memory of some great battle, or as memorials in a common cemetery of the dead. The people have a singular custom, whenever any of their cattle are diseased, of coming among these stones to pray to St. Cornelius for their recovery. Such a practice may be a remnant of pagan superstition continued in Christian times; but I must remark that St. Cornelius is the patron saint of the neighbouring church. I cannot learn that the peasantry of this country have any traditions about Carnac; and I must here observe that no relations or accounts given either by the poor or more enlightened people of Brittany can be depended upon.'

M. Cambry, in his *Monumens Celtiques*, has given to the stones, which he professes to have measured, much greater dimensions than those assigned to them by Mrs. Stothard, who unhesitatingly charges him with exaggeration. 'I have measured,' says M. C., 'the principal stones of Carnac; the loftiest are twenty-one to twenty-two (French) feet† above the ground; their breadth and thickness vary, as does their height; but some of them are enormous, as in the part near Kervario, near the mill of Kerner. One of them is twenty-two feet in height, twelve in breadth, and six in thickness, without including the part buried in the sand. It ought to weigh, supposing the cubic foot of granite to be 200 (French) lbs., 256,800 lbs.' Ogée, in his *Dictionnaire de Bretagne*, gives dimensions nearly equal to those of M. Cambry, with whom he also agrees in the statement that the stones are placed on the smaller end, and that some appear to be balanced as it were on a pivot, like the 'rocking stones' of our own island. He further supposes, from the nature of the soil, that the stones were quarried on the very spot, and M. Cambry thinks they might have been procured from some quarries a league towards the east; but M. Daru (*Histoire de Bretagne*) describes the monument as being far from all known quarries.

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* Du Cange, as quoted by Ogée, gives, as the translation of Carnac, a burial-place or cemetery.

† The French foot is to the English foot nearly in the proportion of sixteen to fifteen; and the French in. bears nearly the same proportion to the in. [illegible]

The origin of this singular memorial is quite unknown; the conjectures of Mrs. Stothard have been given. Ogée supposes these stones to be the remains of a camp formed by Julius Cæsar, in his war with the Veneti, or people of Vannes; but the nature of the monument puts this supposition out of the question—a Roman origin cannot reasonably be assigned to the monument. Tradition has given to the site of these stones the name of Cæsar's Camp, but tradition in such a question is an insufficient guide. M. Cambry, led by another tradition, reported to him by an old sailor, that a stone was added every year, conjectures, though with hesitation, that the monument has some connexion with the astronomy of a remote age.

CARNAK. [Thebes.]

CARNATIC, a province in the south of Hindustan, extending from 8° to 16° N. lat., and included between 77° and 81° E. long. This province comprehends the former dominions of the Nabobs of Arcot, stretching from Cape Comorin on the S. to the small river Gundigama, by which it is separated from the Circars on the N. On the E. it is bounded by the Bay of Bengal, having a line of coast 560 miles long; and on the W. are Coimbatore, the Barramahal districts, and districts ceded by the Nizam. The breadth of the province is no where greater than 110 miles, and the average breadth is about 75 miles: it is narrowest towards the N. The chain of hills, known as the Eastern Ghauts, commence in the S., about 11° 20′ N. lat., and extend northward in a direct line to 16° N. lat., separating the Carnatic throughout their extent into two divisions, one called Carnatic Balaghaut, or above the Ghauts [Balaghaut]; the other the Carnatic Payeenghaut, or below the Ghauts. The province is further divided in its length into three parts, severally called the Southern, the Central, and the Northern Carnatic. The first of these divisions is S. of the river Coleroon, the northern branch of the Cavery, which runs from Trichinopoly to the Bay of Bengal. This part of the Carnatic did not form an integral part of the dominions of the Nabob of Arcot, but was tributary to that chief. The principal towns which it contains are Tanjore, Trichinopoly, Madura, Tranquebar, Negapatam, Tinnevelly, and Nagore.

The Central Carnatic has the Coleroon for its southern, and the Penaur for its northern boundary. Its chief towns are Madras, Pondicherry, Arcot, Wallajabad, Vellore, Conjeveram, Chingleput, Ginjee, Pullicat, Chandgerry, and Nellore.

The Northern Carnatic comprehends the remainder of the province, and is included between the Penaur on the S. and the Gundigama on the N.: the chief towns are Angole, Carwaree, and Saumgaum.

Wallajabad is 14 miles N.W. from the town of Chingleput, in 12° 48′ N. lat., and 79° 53′ E. long. The town contains extensive military cantonments. Ginjee was formerly considered by the natives to be the strongest fortress in the Carnatic. The works cover the summits and great part of the sides of three detached rocky mountains, upwards of 500 feet high, and difficult of access: the whole are connected by means of lines which inclose the plain between the mountains, and contain within them a fortified barrier, dividing the works into an outer and an inner fort. This fortress was built about the middle of the 15th century, and was successively strengthened by its Mohammedan and Maharatta possessors. It surrendered to the British in 1761, and has since been so completely neglected that in 1820 it did not contain a single inhabitant, while the pettah, the town or suburb, was reduced to about 30 houses. The walls, gates, and bastions were at that time still entire, as well as a part of the seven-storied palace of the rajah, a pagoda, and a mosque. Ginjee is situated in 12° 12′ N. lat., and 79° 28′ E. long., 35 miles N.W. from Pondicherry. The town of Pullicat stands on a lake separated from the sea by a low sandy beach, in 13° 25′ N. lat. and 80° 24′ E. long., 23 miles N. from Madras. The Dutch formed a settlement here as early as 1609, and after the loss of Negapatam, made it their chief station on the Coromandel coast. Saumgaum is situated in 14° 25′ N. lat. and 79° 47′ E. long., 17 miles N.W. from Nellore.

The climate of the Carnatic Payeenghaut, which has the sea on one side and an abrupt mountain-ridge on the other, is considered to be the hottest in India. Immediately upon the coast the heat is somewhat mitigated by the sea-breeze, but 10 or 12 miles inland this breeze does not reach until the evening, and has then lost its cooling property by passing over the intervening country. The failure of this sea-breeze, which sometimes occurs for several successive days, occasions a degree of heat most distressing to the inhabitants, the thermometer rising to 130° in the shade. From May to July, occasional showers occur, and sometimes it rains heavily and continuously for three or four days, by which the air is cooled and vegetation assisted.

The soil of the province near the coast is a mixture of sea-sand and loam, sparingly intermixed with the remains of marine animals, and bearing evident marks of having been once covered by the sea. The sand of this coast is formed of the debris of the mountains washed down by the periodical torrents. The proportion of felspar brought down with the sand is unfavourable to the fertility of the soil. In many parts the soil is strongly impregnated with iron, and in other parts there is a considerable efflorescence of common salt upon the surface in dry weather. The saline substance does not generally extend far inland; but here and there spots of salt ground are met with, and occasionally also a mixture of salt and soda, which, from the use to which it is applied is known in the country as *washermen's earth*. In the valleys along the ghauts, and between the ranges of hills, the soil is chiefly loam and sand, with a considerable proportion of vegetable mould. In these valleys, and especially where they are watered by rivers and tanks, the soil is tolerably fertile; the high grounds are always poor, because of the gradual washing away of the soil which has been deposited in the valleys.

The principal rivers of the province are the Penaur, the Palaur, the Coleroon, and the Vaygaroo. The whole of these have their sources in the table-land above the ghauts, and discharge themselves into the Bay of Bengal. The Penaur rises in Mysore, near the fortress of Nundydroog, and taking a south-easterly direction, falls into the sea at Cudalore, after a course, including its windings, of about 250 miles. The source of the Palaur is very near that of the Penaur: it has a winding course towards the north-east of about 220 miles, and falls into the sea near Sadras, in 12° 31′ N. lat., and 80° 14′ E. long. The Coleroon, as already mentioned, is a branch of the Cavery. The Vaygaroo rises in the high lands to the south of Mysore, flows with a tolerably direct course south-east past Madura, and falls into the sea about twenty miles south of Tondi, in 9° 25′ N. lat., and 79° 5′ E. long. During its course the waters of this river are much employed for irrigation, and near its mouth there is a large tank, by which it is in great part absorbed: its channel is partially dry during part of the year.

The low lands are chiefly devoted to the cultivation of rice, and their rent depends upon the facility with which they can be irrigated. There are four different harvests in the year, two of which are raised upon the same ground. For the first harvest the seed is sown in May, and ripens in September; for the second the seed is sown in June and July, and the grain is cut in October or November; the third seed-time is in September, and its harvest in January or February; and the fourth crop, which is sown between November and January, ripens in April and May. The increase in ordinary seasons is expected to be for the first crop fifty-fold, for the second and third each forty-fold, and for the last from twenty to thirty-fold of the seed, the proportion sown being about ten bushels to the English acre.

The high grounds which cannot be watered are principally employed for raising different descriptions of millet, and a few leguminous plants. Sugar is cultivated only in small quantities, owing to the poorness of the soil. Indigo answers better, and cotton, in some situations, grows luxuriantly: the variety cultivated is the *gossypium herbaceum*.

The great bulk of the inhabitants of the Carnatic are

Hindus, the professors of Mohammedanism being very thinly scattered over the country. A great part of the land is occupied by Brahmins, who do not engage personally in the task of cultivation, but employ labourers of the inferior castes. There are a few Mohammedan farmers whose land is tilled by slaves, but the most numerous class of cultivators are Sudras, many of whom perform all the operations of the farm with their own hands.

The first invasion of the Carnatic on the part of the Mohammedans was in the year 1310, when the Hindu sovereign was made tributary to the Mogul emperor. It does not appear that the conquest of the country was consummated until 1717, in which year Nizam ul Mulk obtained independent possession of the south of India, and the dependence of the Carnatic upon the throne of Delhi ceased. In 1743 Unwer-ud-Deen received from Nizam ul Mulk the appointment of nabob of the Carnatic and of its capital, Arcot. On the death of the nabob in 1749, the succession was disputed by Chunda Saheb and Mohammed Ali, more commonly called Walla-jah. The French took the part of the former, while the latter was supported by the English, and through their exertions was established as nabob of the Carnatic, his right to which office was recognised by the French in the Treaty of Paris, 1763, and the Treaty of Versailles, 1783. Walla-jah, who aspired to the soubahdarry of the Deccan, would gladly have cast off his dependence upon the English, but was retained by them as a subsidiary ally until his death, which occurred in 1795, when he was succeeded by his son Oomdut-ul-Omra. Previously to this event, in 1790, the nabob having failed to make payment to the East India Company of the amount of his subsidy, which had been fixed at nine lacs of pagodas per annum (360,000*l.*), Lord Cornwallis assumed the management of the revenues, and employed the Company's servants for their collection. This course was abandoned in 1792, when the nabob came anew under engagements for payment of the same amount of subsidy, certain districts being rendered liable to be entered upon in case of failure in payment, and in the event of war with Mysore, the whole territory was to be assumed by the Company, a suitable sum being reserved for the maintenance of the nabob.

In 1801 the civil and military government of the Carnatic was transferred to the East India Company by the nabob Uzeem-ud-Dowlah, upon the Company engaging to pay him annually one-fifth of the net revenue of the country, and providing for the principal officers of his government. [ARCOT.]

In every part of the province there were formerly numerous fortresses. Wherever a position was naturally favourable for defence, works were erected. Major Rennell, speaking of this part of India, says, 'The almost incredible number of forts and fortresses of various kinds in the Carnatic occasion a greater number of interesting positions within the same space, than in most other countries. Villages, and even towns, in open countries, are but of a day, compared with fortresses, especially when they derive any portion of strength from their situation, a very common case here.' Since the time when this was written, the province has enjoyed a long continuance of tranquillity; the forts have many of them crumbled to pieces, and those still visible are fast falling to decay, while the towns and villages have multiplied in number and increased in extent.

(Rennell's *Memoir of a Map of Hindustan*; Heyne's *Historical and Statistical Tracts on India*; Mill's *History of British India*; *Reports of Committees of House of Commons on the Affairs of India*.)

CARNATION, a kind of dianthus or pink, a variety of the Dianthus Caryophyllus of botanists, much esteemed by florists for the beautiful colours of its sweet scented double flowers. It is usually grown in rich light loamy soil, in which sand enough is mixed to prevent water stagnating, and is propagated by either cuttings or layering. A great many varieties are cultivated, the most esteemed of which are those with a strong tall stem about three feet high, and regularly formed flowers with the stripes or markings clear, well defined, and broadest near the end of the petals. From their colours they are technically distinguished into *Flakes*, which have but one colour, disposed in stripes upon a white ground; *Bizarres*, which have stripes of two colours; and *Picotees* or *Picquettes*, which have petals notched at the edges, and spotted instead of striped upon a ground that is most commonly pale yellow.

Success in the management of those beautiful plants depends very much upon attention to a great number of minute details, that would be out of their place in a work like this, and upon practical experience. Good information upon the subject will be found in Maddock's 'Florists' Directory,' and Hogg's 'Treatise upon the Culture of Florists' Flowers,' with its Supplement.

CARNE'ADES, a native of Cyrene in Africa, was the founder of the school of philosophy called the New Academy. The precise date of his birth is difficult to ascertain; it was probably about B.C. 214. He appears to have received his first instruction in philosophy from Diogenes the Stoic, and hence the joke recorded by Cicero (*Acad. Quæst.* iv. 30): he sometimes said, 'If I have argued correctly, I am satisfied; if badly, Diogenes shall give back his mina.' He afterwards attended the lectures of Egesinus, master of the academy, and succeeded him in the chair. In this situation he attained great eminence, and so high was the estimation in which he was held that (Cic. *De Orat.* ii. 37; Aul. Gell. vii. 14) he was selected with two others, Diogenes the Stoic, and Critolaus the Peripatetic, to go on an embassy from Athens to Rome (B.C. 154). Cicero (*De Fin.* iii. 12) praises him for his great eloquence, which Aulus Gellius (vii. 14) describes as vehement and rapid, differing in this respect from the correct and elegant style of Diogenes and the quiet and chaste style of Critolaus. Cicero (*De Orat.* ii. 38) says that he never defended a point which he did not prove, or opposed an argument which he did not overthrow. Even other philosophers and orators, it is said, constantly resorted to his school. (Diog. Laert. *Life of Carn.*) Carneades not unfrequently sacrificed personal comfort and cleanliness to ardour in his favourite pursuits; he sometimes forgot to take his meals, and often grudged the time necessary for combing his hair, &c. Before disputing, as he frequently did, with Chrysippus the Stoic, he was accustomed to brace the powers of his mind by the exhibition of hellebore. (Valer. Max. viii. 7.) He died at the age of ninety, according to Cicero (*Acad. Quæst.* iv. 6) and Valerius Maximus (viii. 7).

The doctrines of Carneades appear to have differed little from those of Arcesilaüs and the other philosophers of the Middle Academy. The difference consisted more perhaps in the mode of statement than in the tenets themselves. Clitomachus, who succeeded Carneades, owned that he was never able to ascertain what the precise doctrines of his predecessor were. Carneades maintained that as the senses and understanding frequently deceive us, nothing which we learn by means of them can be certain; that the highest point we can attain is great probability, and that of probability there are several degrees. He considered that all the knowledge which the human mind was capable of gaining ought not to be called knowledge but opinion, as there was no sure test of truth. Arcesilaüs appears to have maintained the same tenets, but to have asserted them in a broader and more offensive manner. He was chiefly employed in destroying the systems of others by means of his doctrine of uncertainty, and he almost entirely disregarded the application of his principles in the form of ethics; while Carneades, on the other hand, devoted himself partly to their practical use in the affairs of life. The constructive method of Carneades preserved him from the odium and suspicion which the destructive and aggressive method had brought upon Arcesilaüs. [ARCESILAUS.]

CARNEGIE, SIR ROBERT, of Kinnaird, son of John de Carnegy, who was killed at the battle of Flodden, was sometime chamberlain of Arbroath, and having attached himself to the regent Arran, was, on 4th July, 1547, appointed a lord of session, but under proviso that, until an actual vacancy should occur, he should draw no salary or emolument from the place. The following year he was sent to England to treat for the ransom of the earl of Huntly, chancellor of Scotland, who had been taken prisoner at the battle of Pinkie. He was soon afterwards despatched on a mission to the court of France; and when there was requested by king Henry II. to use his influence with Arran for the resignation of the regency in favour of the queen dowager, which was effected. In 1551 we find him clerk to the treasurer of Scotland, and one of the commissioners named to conclude a peace with England; and in 1554 and 1556 he was again employed in a like capacity. At the breaking out of the Reformation he at first took part with the queen regent, and was employed by her in negotiating with the lords of the congregation; but afterwards he joined the latter, and was despatched by them to the courts of England and France to explain their intentions. He died on the 5th July, 1566; and in the queen's letters nominating his successor on the bench, he is described as a person 'well inclined to justice, and expert in matters concerning the common weill of this realm.' He was in all likelihood the author of the work on Scots law, which is cited in Balfour's 'Practicks' by the quaint title of *Lib. Carneg.*, or Carnegie's book.

CARNELIAN. [AGATE.]

CARNIOLA (KRAIN), a former duchy of Austria, now forms three of the five circles into which the government of LAIBACH is divided: the other two circles, Klagenfurt and Villach, correspond respectively to Lower and Upper Carinthia.

CARNIVAL, or CARNEVAL, from the Italian *Carnevale*, or Farewell to Flesh. It is properly a season of feasting, dancing, masquerading, and buffoonery, which begins on the Feast of the Epiphany, or Twelfth Day, and ends on Ash-Wednesday, when it is succeeded by the austerities of Lent. Some of the license of the Saturnalia of the antient Romans is still detected in these long revels, which are now confined to Catholic countries, and seem to be rapidly declining even in them. Milan, Rome, and Naples were celebrated for their carnivals, but they were carried to their highest perfection at Venice,

> The pleasant place of all festivity,
> The revel of the earth, the masque of Italy.

In modern Rome the masquerading in the streets and all the out-of-door amusements are limited to eight days during which people pelt each other with sugar-plums, and are treated with horse-races, in which horses run without any riders on their backs. After the races of the eighth day, masquers go about with tapers in their hands, every one trying to light his own at his neighbour's candle, and then blow out his flame. This is the last of their frolics, and about as rational as any part of a Roman carnival.

CARNIVORA (Zoology), a term generally applicable to any creatures that feed on flesh or animal substances, but more frequently applied to that order of mammiferous quadrupeds which prey upon other animals.

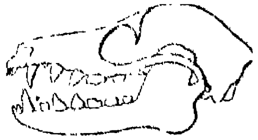
The forms of this order are varied, and the number of species considerable. Furnished, like man and the quadrumana, with three sorts of teeth, and nails or claws on the feet, they entirely differ from those two orders in never having the thumbs of the anterior extremity capable of being opposed to the other fingers. The greater or less development of their molar teeth, as cutting or lacerating instruments, seems to determine the kind of animal food fitted for their support. Those carnivora which have their molars totally or partially tuberculated partake of a diet in which vegetables form a greater or less proportion, and those which have them serrated as it were with points live principally on insects. There are other modifications of these molars, fitting them for crushing bones or dividing animal muscle, according to the exigency of the animal; but in all, as a general rule, the articulation of the jaw does not permit of horizontal movement, the power being simply that of opening and shutting upwards and downwards, like a pair of shears.

General Organization.—The prevailing feature of the skull is the great development of the zygomatic arch, affording room for the action of the powerful muscles that work the trenchant jaw; the orbit is not separated from the temporal fossa. The articulation of the bones of the fore-arm in most of the carnivora is so constructed as to allow of free motion, though in a degree inferior to that bestowed on the quadrumana. The brain (cerebrum) is considerable in bulk, well marked, but without a third lobe, and does not cover the cerebellum; of all the senses, that of smelling seems to be in the highest perfection, the pituitary membrane being extended over a manifold labyrinth of bony plates. The intestines are comparatively short, the nature of their food requiring less elaboration than that necessary for the extraction of nourishment from vegetables.

Cuvier gives the name of *Carnassiers* (flesh-eaters) to the order, and divides it into the following families:—

1. CHEIROPTERA.

These, as he observes, have still some affinities with the quadrumana, as is manifested by the pendulous genital organ of the male, and the position of the teats of the female on the breast. Their distinguishing character consists of a fold of the skin, which, rising at the side of the neck, is extended between the fore-feet and the fingers or toes, so as to suspend the animal in the air, and, in those genera which have the bones of the hand sufficiently developed to spread a sufficient extent of this membranous skin, there is a power of executing all the evolutions required for flight. Strong clavicles and large shoulder-blades were required for this feat, and we accordingly find great strength and solidity thrown into those parts; but as the rotatory motion of the fore-arm would have been worse than useless, inasmuch as it would have weakened the force of the impulse of the membranous wing, and would have consequently lessened the power of flying, we find it almost entirely absent. Four great canine teeth are found in all the genera of this large family; but the number of their incisors varies. Some idea will be formed of the arrangement of the teeth in the cheiroptera from the following cut:—

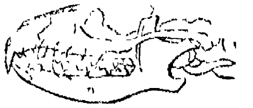


[Skull of Pteropus Keraudrenius.]

In the cheiroptera, as we have seen, the teats are pectoral, but in all the rest of the families they are ventral. The next family in Cuvier's arrangement is

2. INSECTIVORA.

The lateral membranes with which the cheiroptera are furnished are no longer to be found in the insectivora, which still have clavicles, and their molars, like those of the first family, are serrated with conical points. In their dental system the position and relative proportion of their incisors and canine teeth vary. Some have long incisors in front, followed by other incisors and canines lower than the molars, a scale of dentition to be found among some of the quadrumana (genus *Tarsius*), and approaching in a degree the dental system of the *Rodentia*. Others have large and widely-separated canines, between which are small incisors, the most ordinary disposition of the teeth in the *quadrumana* and *carnassiers*. The feet are short, and their motions comparatively feeble: the male organ is furnished with a sheath, and the teats are ventral. There is no cæcal appendage, and the entire sole of the foot is applied to the ground in walking. Their habits, resembling in a degree those of the cheiroptera, are frequently nocturnal and subterranean. Insects form their principal nourishment, and many of them, especially in cold countries, pass the winter in a dormant state.



[Skull of Erinaceus Europæus, common Hedgehog.]

Hitherto we have seen the carnivorous organization in a comparatively mitigated state, but we now approach Cuvier's third family, the Carnivora, properly so called, which have every part of their frame, in the cats especially, formed for the destruction of other animals. In two of the tribes, but more particularly in one, viz. the Plantigrades, the carnivorous form is indeed somewhat modified; but among these three tribes we find the greatest harmony of parts, fitted for keeping down the numbers of the granivorous and phytophagous animals, to be anywhere observed among the mammalia.

3. CARNIVORA.

In this family we have the thirst for blood at its highest degree of development, and with it the power and the instruments for gratifying the appetite. Four large, long, and distant canines, separated by the intervention of six incisors in each jaw (the root of the second of the lower incisors being a little deeper planted than the others)—molars, either formed entirely with cutting edges, or constructed partly with blunt tubercles;—these, with the powerful mechanism of the jaw in which they are set, present a most formidable apparatus for finishing the bloody task which the rest of the frame of the carnivora is so nicely adapted for commencing and continuing. The more completely trenchant these molars are, the more completely carnivorous are the habits of the animal, and the different gradations may be in general safely traced by observing the proportional extent of surface, considered with reference to its tubercular or cutting shape. The bears, which, taken as a whole, may be said to be capable of supporting themselves entirely on vegetables, have nearly all their molar teeth tuberculated. [Bear.]

The anterior molars have the most cutting edges, and then comes a molar larger than the rest, with a tuberculated heel or process more or less developed, and behind it one or two small teeth almost entirely flat. With these small teeth the dogs, as Baron Cuvier has observed, masticate the grass which they occasionally swallow for medicinal purposes; and the same author agrees with M. Frederic Cuvier in naming the great molar above and its antagonist below *carnassières* or *flesh-cutters*, the anterior pointed molars *false molars*, and the posterior blunt molars *tuberculeuses* or *tuberculated molars*.

By observing these differences of dental form, the genera of carnivora are most surely established, and it may be laid down as a general rule that those carnivorous animals which have the shortest jaw and the least development of the *false molars* are those in which the sanguinary propensity and the destructive power co-exist in the highest degree.

Many of the genera apply the whole sole of the foot (particularly of the hinder one) to the ground in walking, and this sole is generally destitute of hair; these are called *Plantigrade*.

Others again walk on the tips of the toes as it were, and these, the *Digitigrade* carnivora, are endowed with great swiftness of foot. The clavicle in both is merely a bony rudiment suspended in the flesh.

Cuvier divides his *Carnassiers* into the four following tribes:—

1. *Plantigrades.*

These possess a great facility, from the structure of the sole, of rearing themselves up on the hind feet. Cuvier observes, that they participate in the comparative slow motion and nocturnal life of the Insectivora, and that they are, like them, deprived of a cæcum. The greater part of those whose geographical distribution is confined to cold countries pass the winter in a dormant state. They have all five toes on each foot. [Bear.] The following cut will serve as an example of the dental form and arrangement.

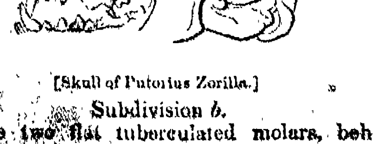
[Skull of Meles vulgaris, common Badger.]

2. *Digitigrades.*

This tribe is separated by Cuvier into two subdivisions.

Subdivision *a.*

The animals composing this subdivision have been called *vermiform*, from the comparatively great length and flexibility of their bodies and the shortness of their legs. Every one who has watched the serpentine movements of a ferret must have been struck with the great facility of motion given by this form, and its particular adaptation for passing through small openings and narrow burrows and turning therein. Like the former families they have no cæcum, but, unlike them, they are not lethargic in winter. Though small, they are of indomitable courage and ferocity, and literally most blood-thirsty; for the greater part of them live principally upon that fluid. The subjoined cut will give an example of the general form of the skull and teeth.

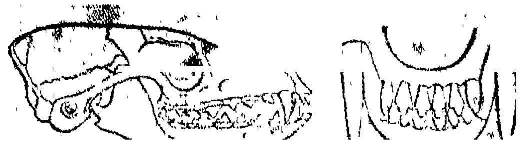


[Skull of Putorius Zorilla.]

Subdivision *b.*

These have two flat tuberculated molars, behind the upper great flesh-cutter, which has itself a sufficiently large heel or process. Many of these live upon carrion, and all have a small cæcum. [Dog.]

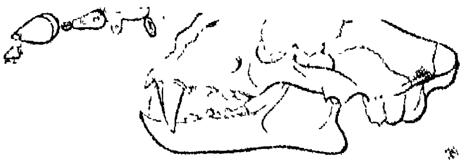
We refer to the next cut for a general idea of the dental system.



[Skull of Canis Vulpes, common Fox.]

3. *Cats* (*Felis*).

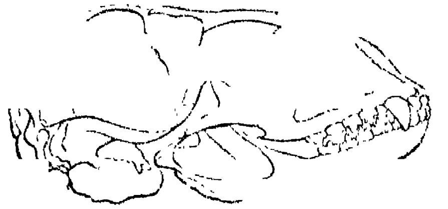
In this tribe we have the destructive power most highly developed. The short round muzzle, the abbreviated and powerful jaw, and the retractile claws sheathed by means of elastic ligaments when the animal is in a state of repose, so that they are kept sharp and ready for action, form with the rest of the organization a destructive type of the highest order! All the cats have two false molars above and two below; their upper flesh-cutter has three lobes and a blunt heel or process within; while the lower one has two pointed and cutting lobes, but without any heel or process; and they have but one small tuberculated molar above without any corresponding tooth below. The species are numerous, and vary greatly in size and colour. [Felis.] Subjoined is a cut of the skull and jaw of a royal tiger.



[Skull of Felis Tigris.]
a, teeth of upper jaw.

4. *Amphibia*, or *Amphibious Carnivora.*

Those who have seen a seal on the land will have noticed the comparative helplessness of the animal: for the short limbs enveloped in the skin only serve them by assisting their awkward shufflings when in that situation.—But as they never come on the land excepting for the purposes of repose, basking in the sun, or suckling their young, their organization is adapted to that element in which the great portion of their life is spent. The moment the seal enters the water he is completely at his ease. Then the oar-like membranous hands and feet, or flippers, as some of our northern navigators not unaptly term them, the elongated body and moveable spine with its powerful muscular machinery, the narrow pelvis and the close waterproof fur, afford, when taken together, a model for swimming. The annexed cut of the skull of a common seal will illustrate the general form and arrangement of the teeth. [Seal.]



[Skull of Calocephalus vitulinus.]

Fossil Carnivora.

Remains of the mammiferous carnivora are found abundantly in the ossiferous caverns and osseous breccia. Those of a lion, a tiger, bears, a glutton, a weasel, a wolf, a fox, a dog, and hyænas, have been satisfactorily identified; but the bears, especially the great cavern bear (*Ursus Spelæus*) [Bear], and the hyænas, seem to have been predominant in many of the localities.

CARNOT, LAZARE NICHOLAS MARGUERITE, was born of respectable ancestry at Nolay, in Burgundy, May 13, 1753. He entered the army in the corps of engineers in 1771, and at the time the revolution began, was known as a respectable and well-informed officer, who had gained the prize of the Academy of Dijon for an *éloge* of Vauban, and had refused large offers to enter the service of Frederick of Prussia. In 1791, he was elected to represent the Pas de Calais in the legislative assembly, and became a member of the military committee. He was one of those who voted the death of the ex-king. In 1793 he became a member of the committee of public safety. His name does not directly appear as an advocate of, or agent in, any of the excesses of the violent republicans; but as a man who stood high in place during these times of fury, he must remain under more or less of suspicion until the history of the revolution has undergone an analysis, which cannot perhaps be fairly made so long as the two great parties into which it divided Europe continue to exist in opposition. His attention was entirely directed, so far as his acts are evidence, to the affairs of his profession; he was in truth the war-minister of the committee. The most glorious period (in a military sense) of the republic was that in which he directed the raising of all the *matériel* of the army, and it was afterwards said of him that he had '*organisé* la victoire.' In 1793 he joined the army of the north with other deputies; the inefficiency of another general called him into action, and he was mainly instrumental in gaining the victory of Watignies. In 1795 he was elected for seventeen different places, but was shortly afterwards proscribed, and sought refuge in Germany. He was recalled by the first consul, and was made minister of war. This post he lost when he voted against the consulate for life, and at the same time all the other military situations which he held. But after the Russian campaign, when France was on the eve of invasion, he offered his services to Napoleon, and received the command of Antwerp, which he held out until the abdication of 1814. When Napoleon returned from Elba, he wished to return to Antwerp, but the emperor is said to have told him that a machine would answer the purpose there; he was again appointed minister of war. After the restoration, he retired first to Warsaw, and then to Magdeburg where he died, August 2, 1823. He was twice a member of the Institute, and twice expelled, the first time by the directory, and afterwards on the restoration of 1814.

He published, in 1786, an 'Essai sur les Machines en général,' and in 1808 his work 'De la Défense des Places Fortes.' The latter is a remonstrance to the officers of the army upon the disposition which existed to consider a place untenable after the enemy had gained the glacis. He endeavours to show that the most serious part of an officer's duty only begins when the body of the place is attacked, and brings a large number of illustrations from antient and modern warfare. He also explains the system of defence which goes by his name, namely, that of covering the guns from the enemy, and using them for vertical firing only, until the attack upon the body of the place begins.

The mathematical works of Carnot are remarkable for the elegance of his geometry and the clearness of his mode of expression. In his 'Réflexions sur la Métaphysique du Calcul Infinitesimal,' he enters upon the consideration of the system of Leibnitz; and the main point of his theory is, that there is a compensation between the infinitesimals of inferior orders which are rejected on both sides of an equation. In his 'Géométrie de Position,' Paris, 1803, his object is to explain the meaning of the negative sign in geometry, but at the same time he gives a large number of new and very general theorems. Here he is the inventor of that class of general theorems which have since been pushed to a great extent by MM. Poncelet, Dandelin, Quetelet, Chasles, &c. There is also his memoir upon the relation of five points taken in space, followed by his theory of transversal
Paris, 1806. The essay on machines in general was enlarged and republished in 1803, under the title 'Principes fondamentaux d'Equilibre et du Mouvement.' He published also some political tracts, and in particular, a justification of his public conduct in 1815.

We know of no references for the life and works of Carnot. We have taken dates from the 'Biographie des Contemporains.' We take this opportunity of saying, that the sooner the French Institute publishes the *éloges* of the members who were not permitted to remain on its list by the restored and now re-expelled dynasty, the better for its own reputation.

CAROB TREE. [CERATONIA.]

CAROCOLLA. [LIMACINEA.]

CAR'OL (*Carola*, Ital.), a song of joy. Boccaccio seems to have considered the term as synonymous with *ballata*, which, according to the dictionary *Della Crusca*, signified a song sung during a dance. It does not, however, appear so clear to us as it did to Dr. Burney, that Chaucer used the word in the sense in which the Italian novelist employed it. In England the term is now exclusively applied to a religious song or ballad, in celebration of Christmas, still sung during the festive season in many parts of the country, though now seldom heard in the metropolis.

CAROLINA, NORTH, one of the States of the North American union, lies on the Atlantic, extending from 33° 50′ to 36° 30′ N. lat., and between 75° 30′ and 84° W. long. Its extreme length from near the source of the Tenessee river to Cape Hatteras is 420 miles, and its average breadth may be about 120. Its area is 49,500 square miles, or nearly equal to that of England without Wales. It is bounded by the ocean (300 miles), by South Carolina (308 miles), by Georgia (70 miles), by Tenessee (200 miles), and by Virginia (330 miles).

The western portion of this state, which is somewhat more than one-fourth of its surface, lies in the Appalachian mountains, and is traversed by several of its ridges. To the E. of them extends the higher terrace, or the hilly country, which occupies a little more than one-fourth of its surface. Between this region and the coast spreads the lower terrace, or the level country, which comprehends nearly one-half of the state. The boundary line between the two terraces begins on the N. at the Mundford Falls of the river Roanoke above Halifax, and extends S.S.W. to Smithfield on the Neuse, and to Averysborough on Cape Fear River, and terminates on the river Pedee between Rockingham and Sneadsborough.

The coast runs from the borders of South Carolina in a general E.N.E. direction to Cape Hatteras, and hence nearly due N. to the borders of Virginia. It exhibits a very peculiar character. Besides Cape Hatteras, it has two other projecting points, Cape Lookout and Cape Fear, which latter is on an island, about eight miles in length, and from one to three in width, called Smith's Island. By these three capes two open bays are formed, Onslow Bay and Raleigh Bay. Near Cape Fear is a deep inlet, formed by the mouth of the Cape Fear River; but along the whole shore of Onslow Bay, an extent of 120 miles, the flat coast is lined by low sandy islands, extending parallel to the shore at a distance of about a mile, the islands themselves being from half to one mile wide. This series of islands is traversed by several inlets, which are not practicable, except New Inlet and Bogue Inlet, and these only for small vessels. Near Cape Lookout, and between it and Cape Hatteras, the same character of coast continues, except that the islands are not so frequently broken by inlets, but continue in one place forty or fifty miles and upwards. The islands are also broader, measuring from one to two miles in width. But though along this coast the sandy islands extend in straight lines, the shores of the mainland behind them are broken by numerous arms of the sea, which penetrate to a considerable distance inland. There are also two extensive sounds, Pamlico and Albemarle Sound. Pamlico Sound extends from S.W. by W. to N.E. by E. seventy miles, with a mean breadth of fifteen, and terminates inland in the wide bays of the Neuse and Pamlico rivers. It is connected on the N.E. with Albemarle Sound, and opens into Raleigh Bay by Ocracock Inlet, which may be considered as the mouth of the sound, and has fourteen feet water at mean tide. Albemarle Sound runs due W. into the mainland, about sixty miles by ten miles in width; but it sends off lateral branches, especially to the N., which run from twelve to fifteen miles inland. Albemarle Sound has no practicable connexion with the ocean. The peculiar character of the coast of North Carolina deprives it of good harbours, though there are several large rivers. Cape Fear, with eighteen feet water, is the deepest inlet that the state possesses. Owing to this circumstance the trade of central North Carolina, which is the most fertile portion of the state, has been turned into Virginia and into South Carolina.

The low country, stretching from 100 to 140 miles inland from the coast, exhibits two different aspects. Along the shores it is partly covered with extensive swamps, the largest of which are near Albemarle and Pamlico Sounds. Between them is the Alligator Swamp, more than fifty
miles in length, and nearly thirty in brea
Albemarle Sound is the Dismal Swa
into Virginia. The swamps S. of the Neuse river are of
less extent; though several of them are from fifteen to
twenty miles in diameter. The princ
Shelter and Green swamps. The
of the tides, and partly also of land-
compared to the Sunderbunds in the
They are mostly covered with h
(*Cupressus disticha*), cedars
and
pines (*Pinus tæda* and *Pinus*
land which intersect the swam have in general

oil, and much rice and cotton is raised on them. Between he swampy country and the hilly region extends, in breadth ty miles and upwards, a tract of sandy land, which is mostly level; but in some places there are hills 200 feet above the adjacent country. The soil is sterile, and the surface overgrown with pine forests. Along the water-courses the soil is better, and the pines are replaced by oak, hickory, maple, beech, &c. This part of the country is only cultivated on the river-bottoms.

The upper terrace, or hilly country, lying between the pine-lands and the mountains, is, at a mean, several hundred feet above the sea, and presents an agreeable succession of moderate hills with gentle ascents, and of wide and extensive valleys. The soil of the valleys is good, consisting of a black and fertile mould, and yields rich crops of grain.

That portion of North Carolina, which is within the Appalachian mountains, is an agreeable alternation of hills and valleys. The mountains form two ridges, of which the W. is called the Iron Mountains (and part of it also the Stone, and another part the Smoky Mountains,) and the E. the Blue Ridge. Both are united at several places by short intermediate ridges. The Ararat or Pilot Mountain is east of the Blue Ridge, and about 16 miles N. of Salem; it is a solitary pyramidal hill, 1550 feet high, from the summit of which rises an almost perpendicular column to the height of about 200 feet. The rivers which rise between the two ridges run W. to the Tenessee river. The highest summits of the mountains exceed 3000 feet, and it is thought that the elevation of the whole country comprehended between them is 1000 feet above the sea. The soil is in general fertile in grain.

All the rivers have rapids where they pass from the hilly country to the low region. Their course above the rapids is rather swift; but below them no other current is observed than that produced by the tide, which ascends to the rapids. They offer therefore an easy navigation up to the hilly country; but sand-bars invariably occur at their mouth, on which there is less water than in the lower part of their courses, though they are generally shallow, if we take into the account their length and volume of water.

The Roanoke is formed by two branches, the Dan and Staunton, which rise and unite in Virginia. After their union the river runs S.E. by E., and forms, six miles above Halifax, the Mundford Falls. Lower down its course is excessively circuitous; it falls into Albemarle Sound. Its course is 150 miles; but each of its upper branches runs more than 100 before their junction. It is navigable nearly thirty miles from its mouth for vessels of considerable size, and boats from twenty to forty tons can ascend to the falls, which are seventy miles from its mouth. The Neuse rises in the centre of the upper terrace, and runs about 200 miles, first S.E., and then S.E. by E. Below Newbern it gradually spreads into a semicircular bay, which opens into the wider expanse of Pamlico Sound: it is navigable for boats in the greater part of its course. Between the Roanoke and the Neuse is the Tar, which also enters Pamlico Sound. Cape Fear River rises on the E. border of the mountain region, and flows by a general course S.E. for 250 miles, till it enters the Atlantic about ten miles N. of Cape Fear. It is navigable for vessels drawing ten or eleven feet to Wilmington, 34 miles from the sea; and sloops may ascend to Fayetteville, which is 95 miles higher up.

The climate varies in the three natural divisions of the state. In the mountain region the frost sometimes lasts three or four months; but is not much felt in the hilly country, and still less in the low plain. The summers are hot and sultry in the plain; and the exhalations from the swamps render it unhealthy from June to October. In the hilly region the heat is moderated by cool breezes. The changes of temperature are sudden and frequent, a cold night being often succeeded by an intensely hot day. The climate of the mountains is very temperate and healthy. The difference of the climate influences the agricultural prod[illegible]. On the hot plain cotton is the staple production; rice also is extensively cultivated, and indigo to a small amount. Farther westward these crops are superseded by wheat, Indian corn, and other species of grain, as well as by flax and tobacco. In the mountain region, grain, including Indian corn, is the principal object of cultivation. The fig-tree and the peach generally succeed; and in the western districts apples and pears are plentiful. The pine forests yield a great quantity of turpentine, tar, and pitch; and among the wild growing plants are the ginseng, sarsaparilla, myrtle, and sugar-maple. The wild vine is found all over the country, and in some parts the vine has been successfully cultivated. All the domestic animals of Europe are bred, and swine are reared in great numbers. Wild animals were formerly very numerous, especially deer, bears, &c.; but except wolves and wild cats, few of them now remain. In the upper country the wild turkey is still common, and sometimes weighs from twenty-five to thirty pounds. Snakes occur everywhere; but the alligator inhabits only the swamps and lower parts of the rivers: it sometimes attains a large size, and attacks men. The Roanoke abounds with rock-fish, some of which weigh from sixty to seventy pounds.

The mineral wealth of this state has lately risen to importance. It contains the richest portion of the gold district, which extends at the foot of the eastern declivity of the Appalachian Mountains between 32° and 36° N. lat., the metal has only begun to be worked in the course of the present century, but a considerable produce has been already obtained. In 1804 native gold was for the first time brought to the mint of the United States, and from that year to 1823, inclusive, the average annual amount received at the mint did not exceed 2500 dollars. In 1824 it rose to 5000 dollars, and in 1830 to 518,000 dollars: in 1833 it had further increased to 868,000 dollars. Of this quantity more than one-half, or 868,000 dollars, were got in North Carolina. It is said that not more than one-fourth of the produce is brought to the mint. If this be true, the mines of North Carolina yield an annual produce of nearly three millions and a half of dollars. The chief gold district is situated on both sides of the river Yadkin or Pedee, in the counties of Davidson, Rowan, Cabarras, Montgomery, and Mecklenburg, all of which belong to the hilly portion of the country or the upper terrace. Iron is abundant in the hilly and mountainous districts.

The native tribes have disappeared, except a few families of the Tuscarora tribe who live near the western extremity of Albemarle Sound in Bertie county. They amounted, in 1829, to 3100 individuals. The population is composed of whites and blacks: some of the blacks are free, but the great majority are slaves who cultivate the soil. In 1820 the population amounted to 639,000 individuals, among whom were 14,600 free negroes and 205,000 slaves. According to the census of 1820, it was found, that in the hilly district 18, in the plain 12, and in the mountains a small fraction above 7 persons lived on each square mile. The coloured race is comparatively most numerous on the low plain, becomes less so on the hilly region, and least of all in the mountainous tracts. The population, according to the latest statements, is 737,987, of whom 245,600 are slaves, and 19,543 free persons of colour.

Raleigh, on the Neuse, the capital of the state, is regularly built, but contains only 2000 inhabitants. The largest place is Newbern near the mouth of the Neuse, which contains 4000 inhabitants, among whom are many Swiss families, who have named the town after the town of Bern in Switzerland. Fayetteville, on the Cape Fear River, carries on a considerable commerce, and has 4000 inhabitants. Wilmington, not far from the mouth of Cape Fear River, is also a thriving place, with 3000 inhabitants.

The exports consist of live cattle, tar, pitch, and turpentine, lumber, Indian corn, cotton, tobacco, pork, lard, tallow, bees-wax, myrtle-wax, ginseng, and medicinal roots and plants; most of these are sent to South Carolina and Virginia to be exported thence. A small portion is exported from Wilmington.

The instruction of the poorer classes is less attended to than in many other states of the Union. Though there is a literary fund, it is still inconsiderable, and has not yet so far increased that, according to the laws enacted by the legislature, it can be applied to the instruction of the poorer classes. The children of the coloured people, who in 1830 were calculated to amount to 75,000, between the ages of five and fifteen years, are excluded by the laws from receiving instruction. The instruction of the upper classes is better attended to, but is nevertheless still in a low condition. There is a university at Chapel Hill, 28 miles W.N.W. of Raleigh. It was incorporated in 1793, and first conferred degrees in 1797; it is pretty well endowed, but the number of pupils is small: and a military academy at Mount Airy.

A small English colony was left on the Roanoke in 1587, but it is not known what became of it. The first settlement was made in 1650 by some whites from Virginia. After other settlements the colony received a representative government in 1667, two years after which the constitution called 'Locke's Scheme of Government' was tried but soon abandoned. [CAROLINA, SOUTH.] The present constitution was adopted in 1776.

The legislative body consists of a Senate and of a House of Commons. One senator and two members of the House of Commons are annually chosen by each of the 63 counties; and one member of the House of Commons by each of the towns of Edenton, Newbern, Wilmington, Salisbury, Hillsborough, and Halifax. All freemen 21 years of age, who have been inhabitants of the state for 12 months preceding the election, vote for members of the Commons' House; but a freehold of 50 acres of land is a necessary qualification to vote for a senator. The two houses by joint vote annually elect the governor, who with the council of state, which is elected in the same way, forms the executive. The judges of the supreme and superior courts are appointed by joint vote of the two houses, and hold their office during good behaviour. The state sends two members to the senate in congress and thirteen to the house of representatives.

(Darby; Silliman's *Journal; Mining Review;* Woodbridge's *Annals of Education.*)

CAROLINA, SOUTH, one of the United States of North America, lies on the shores of the Atlantic, between 32° and 35° 10′ N. lat. and 78° 45′ and 83° 10′ W. long. Its greatest length from its E. angle on the Atlantic to its extreme W. at the junction of the Savannah and Chatuga rivers is 275 miles, and its mean width nearly 120 miles. Its area is about 32,000 square miles, or nearly 3000 square miles more than Scotland with its islands.

On the E. it borders on the Atlantic with a coast line of 185 miles. On the S.W. it is separated from Georgia by the Savannah river for 270 miles, and on the N. is North Carolina, forming a boundary line of 300 miles.

South Carolina, like North Carolina, exhibits three different regions. The most western districts are covered with ridges of mountains and hills which belong to the Appalachian system. East of this mountain region extends the hilly country which is followed by a low plain that spreads over the eastern districts of the state to the ocean. But the proportion of the surface belonging to each of these regions differs considerably from that of North Carolina. The low plain comprehends little more than one fourth of the whole, and the remainder is almost equally divided between the other two regions. The line which separates the plain from the hilly region passes from Sneadsborough in North Carolina to Camden on the Wateree, and thence to Columbia on the Congaree, or to the junction of the Saluda and Broad rivers, and terminates on the Savannah at Augusta.

The northern portion of the coast of South Carolina to Winyaw Point forms an unbroken line of low sandy shore. South of that cape the shores, though low, are divided by a great number of inlets, which are the mouths of larger and smaller rivers, that generally divide into numerous branches before entering the Atlantic ocean, and by their numerous channels cut the shores into islands, the surface of which is very little elevated above high tides. The principal islands which line the coast are James', John's, Edisto, St. Helena, Port Royal, and Hilton. The line of coast, though generally uniform as to course from point to point, is very irregularly indented. The inlets dividing the islands as well as the rivers are comparatively very shallow, but the latter in every instance are deeper within than at their bars. In two points only can the coast be approached by large vessels. One place is Charleston harbour, which is formed by the junction of two small rivers, the Cooper and Ashley, the channel of which admits vessels of 16 feet draught. The other is Port Royal entrance, formed by the Broad River, the common æstuary of some little creeks into which the tide ascends to a considerable distance. On one of the numerous inlets which wind through the labyrinth of creeks and islands with which this portion of the coast is chequered, is situated the port of Beaufort, which is spacious, but does not admit vessels so large as those which enter Charleston harbour. St. Helena Sound is nearly 8 miles wide, and runs 10 or 12 miles inland, but it is far too shallow to admit vessels of even moderate tonnage.

The plain along the sea-shore, which extends about 80 miles inland, is a uniform level. At its western border it has a gentle rise and imperceptible ascent to about 200 feet above the sea. The soil, which on the arrival of the Europeans was covered with trees, but is now nearly devoid of them, is in general barren, consisting either of sand or a light blackish earth; but it is intersected, especially along the rivers, by fertile tracts which yield rich crops, especially of rice. A portion is covered with numerous swamps and morasses, which however are not so extensive as in North Carolina; they are overgrown with heavy timber, such as oak, ash, and cypress. On one side of all the rivers, and generally on both, the margin is a swamp from a half to three miles in breadth. To the west of this plain stretches a chain of sandy hills from 20 to 40 miles in breadth, beginning at the upper course of the river Pedee in North Carolina, and extending across the state to the banks of the Savannah. This tract produces nothing but small pine trees and some shrubs, except in the narrow valleys, to which the vegetable mould has been carried by the rains, and which are very fertile. Some of the sand-hills are 200 feet above the adjacent valleys. In this region the rivers form rapids. The country farther west is agreeably broken into hill and dale, and loose stones and rocks frequently occur on its surface. But the valleys and the lower declivities of the hills have a fertile black soil which produces good crops of grain. The more elevated parts of the hills are covered with oak and other hard trees. The hilly country gradually rises into mountains, which at the W. extremity of the state attain a considerable height, the Table Rock in Pendleton being said to be 4300 feet above the Atlantic ocean; the Odeney Mount is supposed to have a still greater elevation. The country between the ridges and mountains may at a mean rise to 1500 feet above the sea. The soil is thought not to be inferior to that of the hilly tract, even the greatest part of the heights being covered with tall trees of hard wood. Where it is cultivated it yields good crops of corn.

South Carolina is very well watered, its rivers being numerous, and some of considerable length. But though their volume of water is considerable, only two are fit for navigation in their lower courses, and even these only for small river boats, on account of their shallowness. But as [illegible] tide ascends to the sand-hills their navigation is easy. [illegible] her up numerous rapids render the transport of goods tedious, difficult, and expensive. The principal rivers are the Pedee, the Santee, and the Savannah.

The Pedee rises in the Blue Ridge in North Carolina, 36° N. lat., and between 81° and 82° W. long., and is first called Yadkin. It flows first N.E. by E. and then turns abruptly to S.S.E., in which direction it traverses the gold region of North Carolina. In South Carolina it continues in the same direction till its junction with the Little Pedee, whence it flows S.S.W. to the port of Georgetown, at which place it is called Winyaw Bay, and forms a wide æstuary. As far as its course is included in this state it is navigable for river-boats. The Santee is formed by two great branches, the Wateree and the Congaree. The Wateree rises in North Carolina, a little W.S W. of the source of the Yadkin, and is here called Catawba. It runs first E. and then S.S E., in which direction it continues through South Carolina to its junction with the Congaree, having flowed more than 150 miles. It is navigable for boats of 70 tons burden to Camden, above which town are the Catawba Falls, where the river in 1½ mile descends 90 feet; but as the falls may now be avoided by a canal cut along the river, called the Wateree Canal, it may be ascended much higher, at least by river-boats. The Congaree, the other great branch of the Santee, is formed by the confluence of two rivers, the Broad River which rises in North Carolina and the Saluda, which takes its origin near the Table Rock, in the most western portion of South Carolina. By their junction near Columbia the Congaree is formed, and to this point vessels of 70 tons burden may ascend. The Congaree, running in a curve to the S.E., unites with the Wateree, from which point the river is called Santee. It flows first S.E. and then turns by degrees to E., and is navigable for large barges and steam-boats, but its mouth is shallow. Its course considerably exceeds 250 miles. The Savannah has its farthest branches in the western district of S. Carolina and the northern parts of Georgia, and forms, during all its course, a distance of 250 miles S.S.E., the boundary between both states. It has 17 feet water on its bar, and is navigable for large vessels to the town of Savannah, and for river-vessels and steam-boats to Augusta, above which town some rapids occur.

The climate of the low plain is very hot in summer, but comparatively mild in winter. Snow seldom falls near the sea, and is soon dissolved. The thermometer ranges between 17° and 93°. In the months of July and August the country is deluged with torrents of rain, accompanied by hurricanes, thunder, and lightning, and the air is loaded with noxious vapours, which generate bilious fevers and other diseases. The driest months are April and May, which are also the healthiest, but November is considered the most agreeable. The cold weather seldom begins before December, and terminates in March. The temperature is liable to sudden and great changes. In the upper country snow and frost occur annually, and the snow is sometimes from 12 to 18 inches deep, and remains on the ground for weeks and even months. The thermometer varies in summer between 65° and 85°, and sometimes rises to 94° and 95°. In winter it ranges between 20° and 55°, and falls to 10° or 11° during the greatest cold, which lasts but a few days. But this country is healthy at all seasons. Hurricanes sometimes cause great damage in the lower country, and earthquakes are felt from time to time, though not frequently.

The principal objects of agriculture in the low plains are rice and cotton, the latter being also cultivated in some districts farther inland. The sugar-cane is only grown with advantage in the Beaufort district, which forms the most southern part of the state. The fruits of the sea-coast are those of the southern countries of Europe, oranges, lemons, pomegranates, olives, and figs. In the upper country all the grains and vegetables of England are grown, with Indian corn in addition. The fruits are also those common in this country. Lately the cultivation of sesamum has been introduced. Among the wild plants the ginseng, gentian-root and wax-myrtle may be noticed. The forests contain many fine timber-trees, especially oak, beech, and hickory.

The domestic animals are those of Europe; black cattle are the most abundant. Many of the wild animals with which the country formerly abounded have disappeared; but still there are found in the mountainous districts, and even in some parts of the lower country, deer, bears, wolves, wild cats, foxes, squirrels, rabbits, racoons, opossums, and polecats. The wild turkey is pretty common in the upper country, and the wild pigeons come at certain seasons in great numbers. Seventeen kinds of serpents are known, among which is the rattlesnake; but they become every day less numerous. Alligators abound near the head of tide-water in the rivers, and grow to a great size.

No metal abounds, except iron, which is met with in several places in the upper country, and is of excellent quality. At some places copper and lead are found, but in small portions. Gold ore seems to be less abundant than in North Carolina or Georgia. The richest deposits occur along the affluents of the Broad River, near the boundary-line of North Carolina. Gold was brought from this district to the mint of the United States in 1831 to the value of 22,000 dollars, and in 1833 it had increased to 66,000 dollars. Among the other minerals slate and limestone are the most useful.

The number of Indians is very small. In the year 1829 they amounted only to 300 individuals, of the tribe of the Catawbas, who inhabit a tract of 15 square miles on both sides of the river of that name, near the boundary line with North Carolina. The remainder of the population consists of Europeans and Africans and their descendants. According to the census of 1820 the number of slaves was 256,457, and of free coloured people 6805, whilst that of the whites was 237,892. The low country was the most populous, averaging 20 individuals on each square mile; in the hilly country 14½, and in the mountains only 11½ were the average for each square mile. The population, according to the latest statements, is 581,185, of whom 315,400 are slaves; and 7921 free persons of colour.

The principal town of South Carolina is Charleston. [CHARLESTON.] The capital is Columbia, on the left bank of the Congaree, immediately below the junction of the Saluda and Broad rivers, which contains a good college and a large lunatic asylum, with a population of 4500. Hamburg, on the banks of the Savannah, opposite Augusta, lies in a district covered with plantations of cotton, and contains 3000 inhabitants. Beaufort, on the island Port Royal, has only 1000 inhabitants. George-town, on the upper end of Winyaw Bay, near the mouth of the Pedee, has some commerce, and 2500 inhabitants. Camden, on the Wateree, is inhabited by 2000 souls.

To facilitate internal commerce a few short canals have been cut, especially to avoid the rapids of the rivers. The most important is the Santee canal, by which the river Santee is united to the river Cooper, and consequently to the port of Charleston.

The exports consist of cotton, rice, tobacco, myrtle-wax, and hides, and the imports of manufactured goods, and the productions of the East and West Indies, with wines from the countries of southern Europe. [CHARLESTON.]

The first settlement of whites in North Carolina was about 1670; but the first permanent establishment was made in 1680 on the site of Charleston. Previously to this, in 1662, Charles II. had granted to Lord Clarendon and seven others all that part of North America between 31° and 36° N. lat.; shortly after, the northern boundaries were extended to 36° 30′. The proprietary government of Carolina lasted till 1719, when the two Carolinas were separated and a royal government was established. During the continuance of the proprietary government, Locke's scheme or constitution was tried, but not found to answer. The present constitution was adopted in 1790, since which date it has been twice amended.

Of late years the instruction of the lower classes has been attended to by the legislature. A sum of from 37,000 to 38,000 dollars is appropriated to the maintenance of a free-school system; and it is stated that from 8000 to 9000 children receive instruction gratis in about 820 free schools. The children of the coloured people, of whom there are 100,036, between five and fifteen years, are entirely destitute of education, the law excluding them from all instruction. The middling and higher classes are much better instructed than in North Carolina or Georgia, and the college at Columbia enjoys considerable reputation. The college at Beaufort was formed by a charter in 1795; but it is nothing more than a respectable academy. There is also a college in Charleston, and two medical colleges. There are in the state three theological seminaries, and two learned societies.

The legislative body is composed of a senate and a house of representatives. The senators, 45 in number, are elected by districts and by ballot for the term of four years, but half the number vacate their seats every two years. The representatives, 124 in number, are chosen for two years. Every free white male citizen, twenty one years of age, paying taxes, or having a certain freehold qualification, &c. has a vote in the election. The executive power is vested in a governor, elected by the joint vote of the legislature for two years. The chancellor and judges are appointed by joint ballot of the two houses, and hold their offices during good behaviour. The number of districts, which name is here substituted for that of counties, is 29. The state sends two members to the senate in congress, and nine to the house of representatives. (Darby; *Mining Review*; Woodbridge's *Annales of Education*, *&c.*)

CARP. [CYPRINUS.]

CARPATHIAN MOUNTAINS, THE, constitute, the Balkan excepted, the most eastern of the numerous mountain systems which cover so considerable a portion of Europe. They form to a great extent the S.W. boundary of the vast plain which stretches over the N.E. of Europe, and thus constitute one of the most remarkable features of its physical geography.

The rock on which the castle of Presburg in Hungary stands, near the banks of the Danube, may be considered as the most W. point of the whole system. From this point the mountains extend N.N.E. towards the sources of the March and Waag, and between the two wide valleys in which these rivers flow. This range, which is about 100 miles in length by 16 or 18 in width, is of moderate height, not exceeding 2000 feet above the sea, and is called the Little Carpathians or White Mountains. The declivities are rather steep, and covered with forests. It is traversed by numerous mountain-passes, the most remarkable of which is that of Lisza, which connects Liza in Moravia with Lisza in Hungary. At its N. extremity occurs the Iablunka-pass, which leads from the valley of the Olsa in Moravia through that of the Bisztrisa into the valley of the Waag.

At this pass, between 49° and 50° N. lat., the range turns E., and continues in that direction from 18° 40′ to 23° E. long. Within these limits it bears different names. The most W. portion is called Magura; the middle, Baba Gura;

and the E. Beszkid, though it seems that the last name is frequently applied to all this range. Its length may be somewhat more than 200 miles, and its width about 20 or somewhat more. Its height increases towards the centre; the Lissa Hora, the highest summit of the Magura range, attains only 4500 feet, but the highest summit of the Baba Gora, which is also called Baba Gura, rises to 5760 feet. Between the N.W. extremity of this range and the most E. point of the Sudetian mountains, which extend between Silesia and Bohemia, lies a plain of no great extent, traversed by the upper course of the river Oder; it has an elevation of about 1000 feet above the sea. A road traverses this range from the vale of the Arwa by the pass of Jordanow into Galizia and leads to Cracow.

To the S. of the Baba Gura mountains, and divided from them only by a deep and not very wide valley, lies the highest part of the Carpathian mountains, called Mount Tatra. It is, properly speaking, not a range, but one enormous piece of rock, extending from W. to E. about 50 miles, and nearly [illegible] from N. to S. in the middle, but decreasing in breadth towards the W. and E. This rocky mass is furrowed by numerous deep ravines on all sides. On the highest part of its surface, whose average elevation is estimated at about 7000 feet, rise several high summits, in the form of peaks, of which some pass above the line of perpetual congelation. The highest is the peak of Lomnitz, which attains 8675 feet above the level of the sea. The peak of Eisthal (Dale of Ice) is only about 36 feet lower, and on its N. declivity is the only glacier which occurs in the Carpathians. The number of peaks exceeding 8000 feet is about twelve, among which the Krywan is one of the most famous, though it does not exceed 8150 feet, and is lower than most others. This portion of the Carpathians presents generally bare rocks on its surface where it is not covered with snow; it contains several small alpine lakes. This enormous mass of rock is divided from all the surrounding ranges and masses by deep depressions. From the Baba Gura mountains it is separated by the valleys of the Arwa and Donajec, which, at their upper extremities, where they meet, hardly rise much more than 2000 feet above the sea. From the Beszkids, which extend farther E., the Tatra mountains are divided by the river Poprad, which surrounds the E. extremity, and, running N., joins the Donajec. The river Waag rises near the sources of the Poprad, and, running W., separates the Tatra mountains from the lower ranges, which extend farther S. and W., and which, from containing numerous mines of metals, have obtained among the German geographers the general name of Ungarisches Erzgebürge (the Ore Mountains of Hungary). These ore mountains occupy a much larger surface than all the ranges already noticed, inasmuch as they extend over all that part of Hungary which lies to the N. of 48° N. lat. between the river Hernad, which rises near the sources of the Poprad and Waag, and falls into the Theiss, and the bend of the course of the river Waag. Its most S. extremity, Mount Matra, stretches even S. of 48°. Its length exceeds 120 miles, and its width 70 miles; but the whole of this surface is not covered with mountains: it presents only a few ranges, running W. and E., and separated from one another by wide valleys, which at some places might be called plains. The range nearest to the Tatra mountains rises to a considerable height, Mount Dumbier attaining 6500 feet, and Kralova Hola, at the source of the Waag, about 5700 feet; but the ridges farther S. are much lower, and their summits rarely exceed 3000 feet above the plain of Hungary, which is about 350 feet above the level of the sea.

The high country extending E. of the river Hernad runs to 22° E. long. due E.: it then declines to E.S.E., and where it approaches 48° N. lat., to S.S.E., till it reaches the sources of the Pruth, Suczava, and Theiss, where the Carpathian mountains may be considered to terminate, and the Transylvanian mountains to begin. The W. portion of this elevated region is called Beszkids, but the whole is commonly comprehended under the name of the Forest Mountains (Waldgebürge) of the Carpathian range. In length it exceeds 200 miles, and its average width may be estimated at from 50 to 70 miles. The mountain-masses do not rise to a great height, nor are the declivities steep; on their upper surface they do not exhibit high peaks, but extend in uneven plains, on which a few elevations, with a very gentle ascent, rise considerably above them. The rivers do not run in longitudinal valleys, as between the ranges farther E., but descend from the sides of the mountains, forming nearly right angles with their general course. On their N.E. side extends the great plain of E. Europe. Only two ranges, of no considerable length and height, branch off from the Forest Mountains, and traverse this plain to some distance. One of them leaves the principal range between the sources of the Saan, an affluent of the Vistula, and those of the Dniester, where 49° N. lat. is cut by 23° W. long. It runs for a short distance (about 40 miles) N.N.W., but then turns E., passes S. of the town of Lemberg, and, dividing the Russian governments of Volhynia and Podolia, advances towards the Dnieper, on whose banks it continues in a direction S.E. to the cataracts between Kidak and Alexandrowska, where it traverses the river and causes numerous impediments in the navigation. This branch is in no place high, and becomes very low as it enters Russia. At the sources of the Pruth, and between them and those of the Sereth and Suczava, several lateral branches set off to the N.E. and E., which render the surface of that part of Galizia, which is called Buckowina, extremely uneven; but they do not extend further than to the banks of the Dniester and Pruth, with the exception of one range, which divides these two rivers, and terminates in low hills, N. of Kisheneff, the capital of Bessarabia. In Buckowina they are called Czorno mountains.

The most remarkable ridge, branching off to the S., is the Telkabanga mountains, which are united to the main range at the sources of the Hernad and Bodrog rivers, and run between these rivers nearly to the junction with the Theiss, a distance of about 90 miles. The average width does not exceed 10 or 12 miles, and its elevation is not great, especially to the S., where it terminates with the hills, on which the wine of Tokay is grown.

Two great roads pass over the Forest mountains. The most western runs N. in the valley of the Bodrog, and traverses the mountains between Sztropko and Dukla by the Dukla pass. The other road, further E., unites Hungary with E. Galizia, and the town of Munkacs with Lemberg, traversing the pass of Vereske.

Only an inconsiderable portion of the Carpathians is of primitive formation. This is especially the case with the Tatra mountain and the ridges S. of it, which are composed of granite, gneiss, and mica slate. By far the greatest part of the W. range belongs to the transition formation, and is rich in metals. The Forest Mountains consist almost entirely of sandstone and slate, and contain only iron in abundance and a small quantity of copper.

The Carpathian mountains are richer in metals than any other mountain-system of Europe. Gold is got from the mountains which surround the valley of the river Gran, at Botza, Kremnitz, Königsberg, and Shemnitz, probably more than 1000 marcs annually, the whole produce of the Hungarian mountains being estimated at 2000 marcs. Silver occurs in considerable quantity in the same places; and the annual value of the silver mines may amount to 70,000 or 80,000 marcs: 92,000 marcs are obtained from all the Hungarian mines. (A marc is 12 ounces.) Copper is very abundant, and occurs in numerous places between the Gran and Hernad. Its annual produce is about 2000 tons. Lead is found in great abundance in all the silver mines, and also in other places. Iron occurs over the whole system, but more especially in the Forest Mountains, and is worked with great advantage in many places. Quicksilver, zinc, antimony, arsenic, and cobalt are also extracted, and some of them in considerable quantity.

Several precious stones occur, among which the opals, found in the district of Sarosh, in the valley of the Hernad, are much esteemed; those collected near Tokay, Kremnitz, and Kaschau have less value. The chalcedonies and garnets are also much valued.

Perhaps in no part of the globe is there such an extensive salt-rock formation as that which lies on the lower declivity of the N. and N.E. descent of the mountains, beginning at the town of Welicska, S.E. of Cracow, and extending round the chain E. and S.E. to the boundary of Wallachia; its length cannot fall short of 600 miles; in width it varies very much. Its depth is conjectured to be upwards of 120 fathoms, at least this is the depth at Wieliczka and Bochnia, the only two places where it is worked by the Austrian government. But in many other places salt is obtained by boiling the water of salt-springs.

The Transylvanian mountains, which begin at the sources of the rivers Theiss and Suczava, and by running first

S.S.E. and then nearly W., inclose the principality of Transylvania, are commonly considered as the E. portion of the Carpathian system; but as no just idea can be formed of the different ranges composing it without a detailed description of the country traversed by them, the description is placed under TRANSYLVANIA. (Hoffmann, Csaplovics, &c.)

CARPEL. If the fruit of a pæony is examined it will be found to consist of two or more hollow bodies terminated by a stigma, and containing vegetable eggs or ovules; taken collectively these are called a pistil, but each separate body is a carpel. A carpel is theoretically a transformed leaf, with its edges brought into contact, united, and generating ovules at the inside of the suture, while its midrib is lengthened and distended as a stigma. If several carpels are arranged in the centre of a flower they have exactly the same respective position as the same number of leaves would have; and their sutures and stigmas are placed in the same position as the united edges and distended points of so many leaves would be placed. Supposing these carpels to grow together by their sides their sutures will then be, with the ovules that belong to them, in the centre of the body formed by such a union. Upon these and similar considerations turns the beautiful modern theory of the real nature of the fruit of flowering plants, and the apparently paradoxical assertion that the fruit of the peach, the pea, and the plum, are merely transformations of the leaves of those plants. (See Lindley's *Introduction to Botany*, ed. 2nd, p. 166, &c.)

CARPENTA'RIA, THE GULF OF, is an extensive open bay on the N. coast of Australia, between 10° and 17° S. lat., and 136° and 142° E. of Greenwich. On its E. and S. shores a level country extends far inland, but the W. coast is high. It is not visited by European vessels, but the Malays of the Sunda islands and the Chinese resort to it for the purpose of taking sea-slugs. This gulf was discovered and surveyed by the Dutch general Carpenter, whose name it bears, and was more accurately laid down by Captain Flinders in 1803.

CARPENTRAS, a city of France, once capital of the Comté Venaissin, subject to the pope, now the chief place of an arrondissement in the department of Vaucluse. It is on the Auzon, a feeder of the Nesque, which flows into the Ouveze, and ultimately into the Rhône: it is in 44° 3′ N. lat., and 5° 4′ E. long., about 360 miles from Paris in a straight line, or about 426 miles by the road through Auxerre, Châlons-sur-Saône, Lyon, Valence, and Orange.

Carpentras is mentioned under the name of Carpentoracte by Pliny, who assigns it to a people called by him Memini. Ptolemy speaks of a people called Μεμηνοι, to whom he assigns a city called Forum Neronis. It has been consequently inferred by Valois and others that Carpentoracte was the Gallic, and Forum Neronis the Roman name for the same place; and in this opinion we are disposed to coincide, notwithstanding the objections of M. D'Anville, who would identify Forum Neronis with Forcalquier. Whether the town was or was not a Roman colony has been much disputed. There are scarcely any remains of its antient buildings: the scanty relic of a triumphal arch was in the seventeenth century incorporated into the episcopal palace then built by the bishop, the Cardinal Bichi, and transformed into a kitchen fire-place; by a strange transition it has since formed part of the gaoler's apartments, the palace itself having been converted into a court of justice. The remains of this arch render it clear that it was once magnificent, but the sculptures are much defaced by the hand of time. Its erection has been variously ascribed to Marius, to Domitius Ænobarbus, who defeated the Allobroges in this neighbourhood, and to Augustus; but all is mere conjecture.

In the middle ages this town shared the usual fate of those around: it became the prey of the barbarians of the north, and of the Saracens; but rising from these overthrows, it grew into importance. It was for about a year (A.D. 1313-14) the residence of the papal court, and perhaps would have continued to be so, had not a fire, caused by a tumult in 1314, rendered it uninhabitable. Carpentras was at this time in the dominions of the pope, to whom it had been ceded by the peace of Paris, A.D. 1228; but the temporal as well as the spiritual jurisdiction of the city was in the hands of its bishop: the temporal jurisdiction was ceded to the pope A.D. 1320. Predatory bands of undisciplined soldiers infested the town and neighbourhood in the 14th and 15th centuries; and in 1562 it was considerable army under the Baron des Adrets, one of the leaders of the Huguenots; but the vigorous defence of the town induced the baron to raise the siege. In 1791 the city with the county Venaissin was ceded by the pope to the French.

The situation of Carpentras is very agreeable; it overlooks a beautiful district abounding with olive-trees. The town is still surrounded by its antient walls, and would be handsome if its streets had been better laid out. There are four gates: that of Orange is surmounted by a lofty tower. Among the public buildings may be mentioned the hospital, the front of which and the vaulted ceiling of the staircase are much admired; the ci-devant episcopal palace; the cathedral, adorned with columns taken from a temple of Diana at Venasque; the aqueduct, a modern erection of considerable extent, which supplies the town with water; and the public fountains, by which the water is distributed.

The population of Carpentras in 1832 was 6294 for the town, or 9817 for the whole commune. Among these are many Jews, who have a synagogue here. With a liberality honourable to the papal government, the Jews were in the middle ages allowed to practise medicine and to engage in public affairs as well as private business; but the remonstrances of the states of the county compelled the pontiffs to withdraw these privileges about 250 or 300 years since. After the restrictions thus imposed on their pursuits, the Jews devoted themselves to commerce, and their numbers increased so that the quarters of the city to which their habitations were limited became extremely crowded. It is likely the population of Carpentras has declined of late years: Expilly (A.D. 1762) and Vaysse de Villiers (A.D. 1813) gave it at 12,000. The trade of the town is considerable: spirit of wine and aqua-fortis are made; and a great deal of business is done in madder, wine, and the other productions of the department. There is a considerable market on Friday.

The town has a public library, said to contain 25,000 volumes and 800 MSS.; a public school; a cabinet of medals; a collection of engravings and antiquities.

The bishopric is very antient, perhaps it was erected as early as the third century: the see no longer exists, the department being included in the bishopric of Avignon.

The arrondissement of Carpentras had, in 1832, a population of 51,269.

CARPET. The consumption of carpets in Gerat Britain up to about the middle of the last century was so very trifling that, as a manufacture, it was hardly deserving of notice; and although now so essential to our warmth and comfort, a few generations since carpets were only partially used in the mansions of the rich. Only a few manufactories, of which that at Wilton was the most important, existed in different parts of the kingdom; and at Kidderminster, which is now the principal seat of the trade, and where at least 5000 persons are employed in its different branches, the carpet manufacture did not commence before the early part of the eighteenth century. We doubt whether at the commencement of the nineteenth century one-fourth of the present number of carpets was manufactured.

We purpose to give here some account of the different descriptions of carpets at present manufactured in Great Britain, and also of the mode of manufacturing each.

In all kinds of carpets the materials are dyed before they are put into the loom. A very curious and ingenious attempt was made three or four years since to print the worsteds while in the process of weaving. A patent was taken out and the object was partially accomplished, but there are so many difficulties to encounter that it is scarcely probable this plan will be brought into general use.

The following kinds are now made in Great Britain:—Axminster, Venetians of different sorts, Kidderminster or Scotch, British or damask Venetian, Brussels, and Wilton or Pile carpeting. These names do not always denote either the present or original place of manufacture. Brussels carpets were introduced into Kidderminster from Tournay in 1745; and we do not know that Venetians were ever made at Venice. Wiltons (which are in fact Brussels carpets) were made on the continent before they were introduced at Wilton; and what are called Kidderminster are made in the greatest quantities in Scotland or Yorkshire.

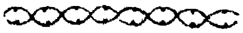
Axminster carpets are made, we believe, solely at Axminster: they are usually made in one piece, according to the dimensions of the room for which they are required. The warp or chain is of strong linen, placed perpendicularly between two rolls or beams which turn round and enable the chain to be rolled from off one beam and on to the other as the weaving of the carpet proceeds. Small tufts or bunches of different coloured worsted or woollen are tied to or fastened under the warp; and when one row of these tufts has been completed the shoot of *linen* is also thrown in and firmly rammed down. Another row of tufts is then arranged in such a manner *as*, by a change of the colours, to form a further portion of the pattern. To guide the weaver as to the position of the colours, a small paper design or drawing constantly hangs before him, from which he works. The tedious nature of this process, and the quantity of materials which it consumes, render this kind of carpet very expensive, and the whole quantity manufactured is trifling. Real Turkey carpets (so called to distinguish them from those Brussels, the patterns of which are made to imitate them) are manufactured in a similar manner, and they are regularly imported, though not in very large quantities. Finger or town made and Stormont rugs are also formed with tufts put in as they are in Axminster carpets; but the warp or chain is laid horizontally, and a common loom, with its usual appurtenances of treadles, gearing, reed, lathe or batten, &c. is made to assist in the process.* In all these carpets the warp and weft, or, as they are called, chain and shoot, which are both of linen, are altogether concealed from the upper surface, the tufts of worsted or woollen being the only part that is visible.

Venetian carpets.—Here the warp or chain, which is of worsted, and generally arranged in stripes of different colours, is alone visible: the shoot, which is of a dark colour and usually black, is concealed between the upper and under surface. By using shoot of different sizes these carpets are somtimes made to assume the appearance of plaids or checks, and by the arrangement of the treadles a twilled or dotted appearance is at other times given to them. Venetians are generally used for staircase carpets, but the plaid kind are occasionally used for rooms. Although dots, waves, small figures, and plaids, are sometimes introduced, the general character of Venetian carpets is a simple stripe throughout. They do not come under the head of figured weaving, no machinery but that of the common loom being required for their manufacture. Woollen, linen, and cotton are all used for the shoot

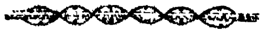
Kidderminster or *Scotch* carpets, or, as the Americans more descriptively term them, in-grain carpets, are wholly of worsted or woollen, or, as is most common, the chain is of worsted and the shoot of wool. The pattern is formed by the intersection of two or more cloths of different colours: but as these cloths may be woven in stripes of different shades by introducing at intervals shoot of different colours, the carpet is usually made to assume a great variety of colours. Wherever this is the case, however, either the upper or under surface must necessarily have a stripy appearance, and the stripes will be seen running across the carpet. The process of weaving these is somewhat complicated, but we will endeavour to give some idea of its nature, and in our description we will confine ourselves to those in which there are only two cloths. These in fact form nineteen twentieths of the whole quantity. A few, called three-plies, are made with three cloths, for the North American market, and we have heard of one instance of four-ply, but we believe the manufacture, if ever accomplished, has been abandoned. Each cloth is perfect in itself, so that if one cloth were carefully cut away the other would remain perfect, and be in appearance like a very course baize. The process of weaving both cloths is carried on at the same time, and in each part of the carpet that cloth is brought to the surface which is required to produce that portion of the pattern. Now suppose the two colours are blue and white, and that the weaver in proceeding with his work is about to throw in the blue shoot—as in common weaving he must raise by his treadles and gearing one half of the blue warp to form the cloth, but he must also raise the whole of the white warp in those portions of the carpet where the pattern requires that the upper surface shall be white—this has to be done by other machinery, as the quantity so to be raised varies with every shoot. After throwing in the blue shoot he has to prepare for the white one, and it is now necessary for him not only to raise, by the treadles, &c. one half of the white warp, but also by the machinery, the whole of the blue warp, where blue is to form the upper surface. He next proceeds to throw the second blue shoot, and has to raise the other half of the blue warp (that which was raised before being now depressed), and also that part of the white warp which this next portion of the pattern requires for the upper surface. The second blue shoot having been thrown, he proceeds to the second white, and raises the reverse half of the white warp and the whole of the blue warp, where blue is to form the surface, and so on as before. The reader will readily perceive that the back of the carpet will necessarily be of exactly the same pattern as the front, but the colours will be reversed. What is blue on the upper surface will be white on the under, and that which is white above will be blue below. Till within a few years the machinery used to manufacture these carpets was of the most clumsy and complicated nature. A great improvement took place about twenty years since, by the introduction of barrel looms, which were constructed on principles similar to those of the barrel organ or musical box. Each pattern however required a change in the barrel and this process was somewhat tedious and expensive. These looms were therefore shortly superseded by the Jacquard machine, which has brought about a vast improvement in many respects, and enabled the largest and most complicated patterns to be accomplished with the greatest facility, accuracy, and beauty.*

British or *damask Venetian* partakes both of the character of Venetian and Kidderminster, though more of the former than the latter. The warp, as in Venetian, is the only part seen, whereas in Kidderminsters the shoot forms by far the greatest portion of what is visible. The consumption of British is however small, and perhaps hardly of sufficient importance to render a particular description necessary. They require machinery similar to that employed in weaving Kidderminsters.

Brussels carpets form by far the most important and increasing portion of the carpet trade. Brussels are composed of linen and worsted, the cloth or reticulated part of the structure being entirely of linen, which is formed into a kind of very coarse sampled cloth, with two threads of linen for the shoot (one above, and the other below the worsted). This will be best explained by a simple diagram of a section of the linen only, the worsted not being shown



in this sketch. The dots represent a transverse section of the shoot; the lines crossing one another are two threads of the warp. Now the worsted is firmly bound in between the upper and under shoot, or as in this sketch, between the two rows of dots, thus: the dotted lines



represent three ends of the worsted, of which there are usually five, each end differing from the others in colour. These ends, as they are technically termed, are composed of one, two, or three threads of worsted, according to the quality of the carpet: the average number is two. Taking it therefore at two, there will always be ten threads, two each of five colours, bound in between every reticulation of the linen. This gives substance, firmness, and solidity to the mass. Having endeavoured to give some idea of the structure and groundwork of the carpet, we must next proceed to explain the formation of the pattern. We have seen that we have five ends of yarn, each of a different colour, at our disposal in every part of the carpet. All we have to do is to bring to the surface that one of the five colours which is required to form that portion of the pattern, and to form it into a loop projecting above the surface. The section then assumes the appearance of the annexed sketch.

This sketch is in fact a section of a bit of Brussels carpet when complete. The business of drawing the required colours to the surface is performed by a child from ten to fifteen years of age, who is called the drawer, and is placed by the side of the loom for this purpose. Each worsted end is made to pass through a small brass eye, called a mail, to which is attached a very fine cord. This cord passes over a pulley fixed at some height above the loom, and is brought down again by the side of the loom, and fixed to a thick stick or roll near to the ground. Now there are generally 260 ends of each colour in 27 inches, the usual width of the carpet; and with five colours in each place we have 1300 ends: there must therefore be 1300 brass eyes or mails, 1300 cords, and 1300 pulleys to each loom*. The pulleys are arranged with great accuracy and neatness in a frame, technically termed the box, which is placed at a considerable height above the mails. The cords being so numerous present a confused appearance to the spectator, but every one has its proper place, and can, when required, be readily traced by the weaver. Now by pulling the cords as they hang by the side of the loom, it is evident we shall raise the brass eyes connected with them, and also the worsted ends passing through those eyes; and all that is to be done is to pull such 260 of those cords as will raise the colours required, one end in each place. To accomplish this, a strong thread is made to twine around the cords, and separate those which are required to bring the proper colours to the surface. This thread is called the lash, and one lash is necessary for every set or row of colours that has to be drawn to the surface. These lashes are taken in regular succession till the pattern is complete. The number of lashes must therefore vary with the length of the pattern; and in a pattern a yard long there are usually 320 lashes.

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* We presume our readers are acquainted with the construction of a common loom, such as is used for weaving cloth or calico; if not, we refer them to the chapter on Plain Weaving, in the volume on the 'Silk Manufacture' of Lardner's Cabinet Cyclopædia.

* A very particular and lucid description of the Jacquard machine is given in the chapter on Figured Weaving, in the volume on the 'Silk Manufacture' of Lardner's Cabinet Cyclopædia. The principle of the Jacquard machine is simple and beautiful.

In describing the process of weaving, we will suppose the loom at work, and every thing ready for proceeding. The drawer takes hold of the first lash with his right hand, and gently draws towards him the 260 cords confined by it: this separates them from the others, and he then firmly grasps them with his left hand, and having loosed the lash, he with both hands and the weight of his body draws the cords down. The 260 ends required for the first portion of the pattern being thus raised above the surface, he with his left hand inserts under the raised ends through the whole width of the carpet, a light wooden board called the sword. The sword is about five inches in width, and being made to stand on its edge, it retains the raised ends about five inches above the surface. The drawer then looses the cords, and prepares for the next lash. When the sword is in, and the required colours thus raised, the weaver using both hands carefully raises any of the ends which stick down by reason of the roughness of the material or otherwise; and having thus formed a clear opening, he inserts the wire under the raised ends throughout the whole width of the carpet. The wire is round, and in diameter about the twelfth part of an inch. After the wire is inserted the sword is withdrawn, and the weaver by means of his treadles and gearing brings above the surface one-half of the linen chain, the other half and the whole of the worsted being depressed. The shuttle with linen shoot is then thrown in. The weaver next raises the reverse half of the linen chain, and the whole of the worsted, the half of the chain before raised being now depressed, and then throws in the second or under shoot. Between throwing the first and second shoot, as well as after the second is thrown, the weaver gives two or three severe blows with the lay or batten, which is very heavy, and he thus forces the materials closely together, and gives firmness and solidity to the mass. The weaving of this wire is now complete. The drawer then draws the next lash in rotation, and he and the weaver proceed as before. When a number of the wires have been thus woven in, they may be drawn out, and the carpet is complete. Care must however be taken not to draw out the five or six wires that have been woven last, or the fresh made loops are in danger of being drawn down, and the carpet blemished. It is necessary that each end of worsted should work independently of the others, and to accomplish this every end is wound on a separate bobbin, and the bobbins are arranged in frames at the back of the loom, with a small leaden weight or bullet to each bobbin to keep the worsted in a proper degree of tension. This adds greatly to the cumbrous nature of a Brussels loom. The linen chains for Brussels and Wilton, as well as the chains for all other descriptions of carpets, are wound on beams as in other kinds of weaving. The Jacquard machine, before referred to, has been constructed so as to take the place of the drawer, pulleys, cords and lashes; and there is little doubt that this machine will soon be brought into general use for that purpose.

Wilton or *pile carpet* differs from Brussels only in this; that the wire, instead of being round, is flattened, and has a groove in the upper surface thus V; and instead of its being drawn out, a sharp knife is drawn along the groove, and the wire is thus liberated. By this means the loops of worsted are all cut through, and the carpet assumes a velvety appearance. The shape of the wire renders it possible to make Wilton or pile carpet of almost any thickness and quality; but this is not the case with Brussels. The manufacture of Brussels carpets was introduced into Wilton soon after its introduction into Kidderminster: the Wilton carpets, being originally a better description of goods, were distinguished by the name of cut or Wilton carpets.

The chief export trade for carpets is to the United States of America; but they are also sent to most parts of the continents of Europe and America. There are no data from which we can calculate either the probable consumption of carpets in our own country, or the amount of the whole manufacture. We therefore make our own statement with considerable diffidence; but we are inclined to suppose the whole number of looms in Great Britain does not exceed 4000: and the value of carpets made in the year, we would estimate at about a million sterling. By far the greatest quantity of Brussels is made in Kidderminster: what are called Kidderminster or Scotch are made in the largest quantities in different parts of Scotland and the north of England.

CARPI'NUS, the hornbeam, a genus of trees belonging to the natural order of *Cupuliferæ*, and distinguished obviously from the beech, the oak, &c. by its cupule being prolonged on one side into a leafy lobe, while its other lobes are shorter, and, as it were, abortive. Ostrya or the hop hornbeam differs in having an inflated membranous cupule surrounding each nut.

Four species are known:—

1. *C. betulus*, or common hornbeam, is an indigenous British tree very common in copses, and frequently pollarded by the farmer. When allowed to acquire its natural appearance it forms a graceful tree from 50 to 60 feet high, very often branching to within a short distance of the ground. In general appearance it resembles the beech, but it does not acquire the smooth plump bole of that tree, nor are its leaves so shining. Its wood is coarse, and unfit for cabinet-makers' work, on account of the large size of its medullary processes; but it is tough, and well suited for cogs, handles of tools, and for other purposes in which strength is required. It is much consumed on the continent as fuel. Like the beech, the hornbeam, if stunted, retains its withered leaves all the winter, and as it bears clipping and close pruning remarkably well, it is much employed for hedges where winter shelter is required. The distinctive character of the common hornbeam is, leaves oblong, cordate, oblique at the base, doubly serrated, smooth, with the veins of the under side, which is very shining, downy at the axils. Lobes of the cupules nearly entire. A cut-leaved variety is known in gardens.

2. *C. Americana*, or American hornbeam. Leaves ovate, oblong, obliquely cordate at the base, doubly or almost simply serrated, smooth, with the veins of the under side downy at the axils. Lobes of the cupules somewhat falcate and serrated. Common from Lower Canada to the Carolinas, and extremely frequent in almost all soils except pine barrens and swamps. It is a smaller tree than the European hornbeam, not usually acquiring a greater height than 15 to 20 feet, although specimens have been found as much as 30 feet high. From the small size of this species it is little used by the Americans; its wood appears however to have the same properties as that of C. betulus.

3. *C. orientalis*, or Oriental hornbeam. Leaves oblong, doubly serrated, cordate, and very little oblique at the base; when young, rather downy: lobes of the cupules coarsely and unequally serrated. It is a bushy tree of small stature found in the eastern parts of Europe, and on the mountains of Caucasus. It is of no known use, and principally differs from the common hornbeam in its downy leafstalks, and green much-lacerated cupules. It is the C. duinensis of Scopoli.

4. *C. viminea* is related to the last, but has taper pointed leaves with simple or nearly simple serratures, and less deeply serrated lobes to the cupules. It is a large hand-

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* This is not always the case. Two cords attached to different mails are usually united before they reach the pulley, so that in this case there are only 650 pulleys and 650 cords passing over them. In these looms the pattern must be repeated twice in the width of the carpet.

some tree with weeping branches, found on the mountains of Nepaul.

5. *C. faginea*, from the same country, is distinguished from the last by its woolly leafstalks and simply setaceo-serrated leaves, which are but little acuminated.

CARPOBA'LSAMUM, a kind of volatile aromatic oil, said by Bruce to be furnished by the Balsamodendron Gileadense. It is produced by the nuts, which have a fleshy kernel yielding the balsam by simple expression. It should be employed while recent, otherwise it loses its odour and becomes inert.

CARPOLOGY is a division of botany comprehending what relates to the structure of seeds and their seed-vessels, or what is commonly called fruit. The subject is usually treated of incidentally in all elementary botanical works; and with much care by Mirbel, in his 'Elémens de Botanique;' and Lindley, in his 'Introduction to Botany.' The only special works upon the subject are Gærtner 'De Fructibus et Seminibus Plantarum,' and Richards's 'Analyse du Fruit;' the latter however is in a great measure obsolete, in consequence of the author having been unacquainted with the true theory of the structure of fruit.

CARRA'RA, a town and territory of Italy, with the title of principality, is annexed to the neighbouring duchy of Massa, both of which belong to the present Duke of Modena, whose mother, Beatrice d'Este, was the last offspring of both the houses of Este and Cibo, the latter of which held the sovereignty of Massa and Carrara from the early part of the sixteenth century. [INNOCENT VIII.] The territory of Carrara consists of about thirty square miles, mostly mountainous, but well cultivated, and with a population of 11,500 inhabitants. It is bounded on the N. by the territory of Fivizzano, which belongs to Tuscany, E. by the duchy of Massa, S. and S.W. by the Mediterranean, and W. and N.W. by the province of Lunigiana, which partly belongs to the Sardinian state, and partly to Modena. It extends in length about eight miles from the sea, to the summit of the Monte Sagro, N.E. of the town of Carrara. The Monte Sagro is 5540 feet high, being one of the principal summits of the Alpe Apuana, a group of the Ligurian Apennines. [APENNINES.] From the S. side of this mountain several lower projections or buttresses extend to the S.W., being separated from each other by narrow valleys, drained by the Torano, Bedizzano, Canal Grande, &c., all of which unite near the town of Carrara, and form the river called Carrone, which flows by Avenza into the sea, about four miles below Carrara. These lower ridges furnish the well-known white marble of Carrara. There are more than 100 different quarries of marble of various qualities, some of which is streaked with purple or blue, and is called Bardiglio. Some of these quarries, such as those of Fantiscritti and Canal Grande, were worked in the time of the Romans. The name of Fantiscritti comes from three figures of Jupiter, Bacchus, and Hercules, which are cut on the vertical side of a marble rock, and near which are inscribed the names of several artists and travellers who visited this spot. An inscription was found in 1810, in the quarries of Colonnata, of the time of Tiberius, with the names of the consuls from the year 16 to 24 of our æra, and those of the decuriones of the place, and of one Hilarius, Magister Villicorum, or superintendent of the workmen. In the time of Augustus, the marbles of Luna, for so they were called from the town of Luna, the ruins of which are seen about six miles S.W. of Carrara, were employed in the buildings of Rome (Strabo, p. 22; Casaub.); but the finer sort, for statues, was discovered about the time of Pliny, when it was substituted by the sculptors at Rome for the marbles of Paros and Pentelicus. After the fall of the empire, the quarries lay neglected till the twelfth century, when, the republic of Pisa having taken possession of this district, the works were resumed and furnished the marble for the school of Niccolo Pisani and his disciples. Since that time new quarries have been opened in succession. Those of Crestola, Cima, Cavetta, and Polvaccio supply the finest marble for statues; those of Ravaccione and Canalbianco furnish large blocks of coarser grain. The various streams turn a number of mills for sawing the marble. The material appears to be inexhaustible; 1200 workmen are constantly employed; the annual revenue is calculated at 750,000 francs, and the value of the exportations of the rough material is half a million. (Serristori, Neigebaur.) The blocks are carried down in carts, drawn by oxen, to the Spiaggia or beach of Avenza, where the storehouses are, and whence the marble is shipped on board the vessels that anchor in the roads. In the town of Carrara are shops for the sale of common objects and ornaments of marble, which are worked by native artists. There is in the same town an academy of drawing and sculpture, which was founded by Maria Teresa, Duchess of Massa, the heiress of the Cibo family, who married in 1741 Rinaldo d'Este, Duke of Modena. The academy was transferred in 1815 to the ducal palace; it has a president and several professors, and a good collection of models. Many foreign artists repair to Carrara for the sake of purchasing the blocks which they require for their works, and which are rough-hewn on the spot.

The name of Carrara is supposed to come from 'Carrariæ,' which, in the Latin of the lower ages, meant quarries, and from which also the French 'Carrières' is derived. The town contains 5000 inhabitants, has a fine collegiate church, begun in the thirteenth century and finished in the fifteenth, also the church of La Madonna delle Grazie, rich in marbles, and that of S. Giacomo, annexed to the hospital, which has some good paintings. The principal square is called Alberica, from the name of the first prince of the house of Cibo, whose title was sanctioned by a diploma of the Emperor Maximilian II., August, 1568. A colossal statue of the last Duchess Beatrice, with a fountain, adorns the square. There are communal schools for elementary education, and a judge of prima istanza for both civil and criminal cases. The Court of Appeal is at Massa, where the governor of the whole province also resides. Avenza, the second town of the principality of Carrara, has 1900 inhabitants; it lies in a plain, about one mile from the sea, the lower hills around being all planted with vine and olive trees. The high road from Genoa and Sarzana to Lucca and Pisa passes through Avenza. There are besides ten other villages with from 200 to 900 inhabitants each. The principal agricultural produce is oil and wine; the corn raised on the territory is not sufficient for one-half of the consumption; the N. mountains are covered with chestnut and beech trees, and pastures. (Repetti, *Dizionario Geografico della Toscana.*) Near the village of Torano is a celebrated cavern, called *del Tanone*, rich in stalactites, which is described by Spallanzani. Carrara has produced several good artists; among others, Danesè Cataneo, a sculptor and poet; the two Tacca, father and son, both sculptors, who flourished in the sixteenth and seventeenth centuries. Pellegrino Rossi, a distinguished living jurist, now professor at Paris, and author of the 'Traité du Droit Pénal,' and other works, is a native of Carrara.

CARRICK. [AYRSHIRE.]

CARRICK-ON-SUIR, partly in the barony of Iffa and Offa E. in the county of Tipperary, and partly in the barony of Upperthird in the county of Waterford, in Ireland, is a considerable town on the river Suir, which is here navigable from Waterford, and is about 85 English miles direct distance S.S.W. from Dublin. This town is known in the records as Carrick-Mac-Griffin, and was a place of considerable note soon after the conquest. Here are the remains of a fine castle built by Sir Edmund Butler in 1309 on the site of an old priory of the knights of St. John of Jerusalem. The same Sir Edmund, who was created earl of Carrick in 1315, built the bridge, which is still standing. In the hall of this castle the news of the rebellion of 1641 was first brought to the great duke of Ormonde, who resided here. Carrick-on-Suir was formerly celebrated for its flourishing manufactures of woollens, principally ratteens and broad cloths, which in 1777 employed about 400 hands. At present the place is only remarkable for the fine scenery of its environs, which a late intelligent traveller considers superior to the vale of Clwyd, and for the wretchedness of its pauper population. All traces of manufacturing prosperity are gone, and the place can scarcely be said to have any trade. It has been proposed to improve the navigation to Waterford, as barges only can ply at present on the Suir, but nothing has yet been effected to turn the advantages of this fine river to due account. Population in the county of Tipperary, 6922; in the county of Waterford, 2704; total, 9626. In 1824 there were four Protestant and 13 Roman Catholic schools, educating 649 males and 484 females. The Roman Catholic free-school cost 1640*l.*

(There is no published history of the county of Tipperary, and the records for Munster have never been printed; information on this town is therefore scanty. See Young's *Tour in Ireland*; Inglis's *Ireland in 1834*; *Parliamentary Reports and Papers.*)

CARRICKFERGUS, the assize-town for the county of Antrim, constituting with its liberties the county of the town of Carrickfergus in Ireland, situated on the W. shore or Antrim side of Belfast Loch, nine miles N.N.E. of Belfast, and 96 English miles direct distance N. by E. of Dublin. The county of the town, as laid down in the Ordnance Survey of Ireland, contains 16,699 statute acres and a population of 8698 persons. The county of the town and parish of Carrickfergus are co-extensive, with the exception of the plots of ground on which the castle, court-house, and gaol stand, which belong to the county of Antrim.

Carrickfergus Castle is supposed to have been founded by De Courcey about the end of the twelfth century, and is a place of considerable importance in the history of Ireland. From the middle of the fourteenth to the end of the sixteenth century it was the only stronghold north of Dundalk which remained uniformly in the hands of an English garrison, and to the loyalty of the townsmen of Carrickfergus is chiefly to be attributed the recovery of the Northern Pale in the reign of Elizabeth. The castle was besieged and taken by Edward Bruce in 1315; it is said that the garrison, before surrendering, were driven to devour thirty Scots whom they had made prisoners. In 1333 the Irish overran all the south part of the county of Antrim [BELFAST], and the garrison of the castle, with the inhabitants of the town that had arisen under shelter of its walls, were left alone in the midst of enemies. In 1386 the town was burned by the island Scots, and suffered again in 1400. In 1503 Gerald Earl of Kildare, lord-deputy, afforded some relief to the struggling colonists by garrisoning the castle. In 1555 the Scots, under Mac Donnell, Lord of Cantyre, laid close siege to the castle till July, 1556, when Sir Henry Sidney relieved the garrison with great slaughter of the besiegers. In 1573 the town was burned by Brian Mac Phelimy O'Neill, chief of Claneboy, who was hanged here along with Mac Quillan, chief of the Route, in 1575; the same year Sorley Buy Mac Donnell (a son of Mac Donnell of Cantyre, who had seized upon Mac Quillan's country a short time before) attacked the town and was repulsed with great loss. At this time the condition of the place is thus described by Sir Henry Sidney:—'The town of Carrickforgus I found much decayed and impoverished; no ploughs going at all, where before were many; and of great store of kyne and cattle belonging to the town, now few or none left; church and houses, saving castles, burned; the inhabitants fled; not above five householders of any countenance left remaining; so that their miserable state and servile fear was to be pitied; yet they are so comforted to hear of her Majesty's gracious disposition to wall their town (whereby they assure themselves of safety and quiet dwelling hereafter) that hope hath and doth procure and draw divers to resort and build here.'

The town had already begun to be walled with an earthen rampart in 1574, and in 1575 the corporation agreed with Sir Henry to build a stone wall seven feet thick and sixteen feet high round a part of the town at *5s.* per *foot*, *6d.* per foot being allowed the inhabitants for the ground. The work however was not completed till 1608, when after various delays the walls were finished with a wet ditch and seven bastions. Meanwhile the Mac Donnells had again assailed the town, and Sir John Chichester, the governor, sallying out 4th November, 1597, to repel the attack of James Mac Sorley, fell into an ambuscade and was put to death by the enemy. The plantation of Ulster and the settlement of Sir Archer Chichester's colony in the S. of Antrim, and of Sir Hugh Montgomery's on the opposite coast of Down, now relieved the inhabitants of Carrickfergus from the more immediate dangers of a hostile neighbourhood, but in the wars consequent on the rebellion of 1641 they had again their full share of the troubles of the times. The castle was first occupied by Munroe (15th April, 1642) on behalf of the Scottish Presbyterians; next (1646) by Monk for the parliament; next (1649) by Montgomery Lord Ardes, for the king; next (1688) by Lord Iveagh, for James II.; and finally, after being obstinately defended by Colonels Mac Carthy More and Cormac O'Neill, and two regiments of Irish Catholics, it surrendered, August 29, 1689, to Duke Schomberg, commanding the army of William III. On Saturday, June 14th, 1690, King William landed here in person, and immediately proceeded S. on that important campaign which decided the future prospects of both countries at the Boyne. On the 21st February, 1760, Commodore Thourot arrived in the bay with one 44-gun frigate and two sloops of war, and having disembarked about 800 men, attacked the town, which, together with the castle, he carried after a smart action the same day. Five days after, the French forces re-embarked, after forcing a supply of victuals and ammunition from Belfast, and were captured on the 28th off the Isle of Man, after a severe action with Commodore Eliot, in which Thourot was killed and 300 of his men killed and wounded. The last scene of violence connected with the history of this veteran fort was the capture of the Drake, a British sloop of war, in the roads opposite the town, by Paul Jones, in the Ranger, an American vessel, on the 24th of April, 1778.

Of the antiquities of Carrickfergus the castle is the most interesting. It stands on a rocky peninsula jutting into the sea on the south-eastern side of the town. This rock, from which the town takes its name (meaning the rock of Fergus, an Irish king of that name, drowned there in pagan times), rises gradually to an elevation of about 30 feet towards the sea, and is entirely occupied by the works of the fortress, consisting of a double ballium or upper and lower yard, with batteries mounting about 25 pieces of cannon and two antient half moons protecting the entrance on the land side. In the upper yard stands the keep, a square tower 90 feet high, formerly entered by an arched doorway in the second story. It has been latterly used as an armoury. The court house and gaol occupy the site of a *Franciscan* monastery, founded here in 1232 by the famous De Lacey, who was buried within these precincts in 1264. On the dissolution of monasteries, the friary, after serving for various civil purposes, came into the possession of Sir Archer Chichester, who built (1610) on the east side of the ruins a splendid house named Joymount after the lord deputy Mountjoy. Joymount afterwards fell to decay, and the plot of ground has ultimately been occupied as above stated. Half a mile W. of the town is the site of the priory of Woodburne or Goodburne, on the banks of the Woodburne river, which has here some pretty falls. The sites of two hospitals are also pointed out as well as of several of the small castles of the early inhabitants. Numerous maps and plans of Carrickfergus as it stood in the reigns of Elizabeth and James are extant, in which these castles appear surrounded by the straw and mud huts of the poorer classes, and each protected by its separate fortifications. Part of the town wall and one of the gates are still standing.

The appearance of the town is respectable, the houses being generally of stone and slated. There are several good streets, of which the chief or high street is terminated by the county gaol and court-house, founded 1799, and built at an expense of 21,785*l.* 6*s.* 4*d.* The gaol is calculated for 240 prisoners. The market-house at the opposite end, where the main street diverges, one branch leading to the quays and castle, and another to the road to Belfast, is a respectable building, built 1755. The parish church of Saint Nicholas is situated on a rising ground on the southern side of the town: its date unknown, but it is of great antiquity, and is a building of considerable size and dignity. The chancel window, presented to the parish by Mr. Burleigh in 1800, is of stained glass, and represents St. John baptizing Christ in the river Jordan. The church is cruciform; the old steeple at the west end of the building was taken down in 1778, and the present handsome spire erected in its place by subscription. A small pier projects from the southern extremity of the rock on which the castle is built, and encloses a dock where vessels of 100 tons can lie at the quay. The custom-house is adjoining: the customs, arising chiefly from a duty on coals, do not pay more than half of the expenses of their collection. The town is not lighted, and water is procured by pumps. There is no poor house or hospital; but a mendicity institution lately organised is understood to be succeeding well.

The governing charter of Carrickfergus bears date 11th James I., A.D. 1612. The corporation consists of a mayor, alderman, and burgesses, with recorder, two coroners, and town-clerk. The mayor is by his office admiral of the coast from Fairhead in Antrim to Bangor in Down, and formerly a third part of all customs within the same limits belonged to the corporation; this monopoly was purchased by the earl of Strafford for 3000*l.* in the year 1637, and materially affected the future trade of the place. This county is distinct from the county of Antrim, and had till lately its own gaol and court-house; but these being now gone to decay the assizes for the county of the town are held in the county court-house. The mayor and recorder sit at the quarter-sessions with the county magistrates. Carrickfergus formerly returned two members to the Irish parliament, and now returns one member to the imperial parliament; the constituency is 732. A committee of the House of Commons, July, 1833, reported that the preceding election for the borough of Carrickfergus had been marked by gross bribery and corruption among the freemen who at present constitute the majority of the electors.

The cotton trade was at one time carried on with vigour here, but it has latterly declined. A pretty brisk trade is now carried on in tanning, brewing, and distilling; but Carrickfergus is far from being a commercial place. A plaice and oyster fishery in the bay gives employment to a considerable number of the inhabitants. In 1823 there were 300 persons employed in various ways by this fishery. The oysters taken here are peculiarly large; the average weight is about 1 lb. 4 oz., and the measure about five inches in length and four in breadth: some have been taken that weighed 2 lbs.: their price has varied at different times from 4*s.* to 18*s.* per hundred.

In 1813 the inhabitants in the county of the town were in number 6225; in 1821 they were 8030: and in 1831 they were 8706. In 1834 their religious distinctions were, members of the Established Church, 1387; Roman Catholics, 974; Presbyterians, 6146; and Protestant dissenters of other denominations, 353: being for their numbers the most Protestant town community in Ireland. In 1821 there were in the county of the town 25 schools, educating 427 males and 343 females; and in 1834 there were 9 schools, educating 415 males and 204 females. In 1813 the schools were in number 19, four of which were kept by Roman Catholics.

(M'Skimmin's *History and Antiquities of Carrickfergus*, 8vo. Belfast, 1823; *Publications of the Record Commission for Ireland; Parliamentary Reports and Papers.*)

CARRIER, one who for hire undertakes the conveyance of goods or persons for any one who employs him. In a legal sense it extends not only to those who convey goods by land, but also to the owners and masters of ships, mail-contractors, and even to wharfingers who undertake to convey goods for hire from their wharfs to the vessel in their own lighters, but not to mere hackney coachmen. As the law has on the one hand thrown great liabilities on those who undertake the business of a common carrier, so it has on the other hand made many provisions for their benefit, in order to protect them from fraud and imposition.

I. *The liability and duties of proprietors of stage coaches carrying passengers.*—These, as well as the hackney coaches of towns other than the metropolis, are regulated by the statute 2 & 3 Will. IV. *c.* 120. In order that the public may be enabled to look for redress to responsible parties, that act provides (sec. 2) that all stage coaches shall be licensed, and a numbered plate fixed on each. The licence specifies the name and place of abode of each proprietor, the names of the extreme places between which the coach is authorized to ply, the days of its journeys, and also the number of passengers it is authorized to carry; and any person may procure a copy of this licence at the office, where it is granted by paying one shilling. A notice of the route, names of proprietors, and the licensed number of passengers, must be fixed on a conspicuous part of the coach, and a penalty of 5*l.* is imposed upon every proprietor, and also upon the driver, in case more passengers are carried than are specified in the licence. The act (sec. 37) also prohibits any outside passengers whatever, or any luggage from being carried *on the roof* of any coach, which is of a greater height from the ground than 8 feet 4 inches; or *the bearing* (that is, *the breadth*) of which, on the ground, is less than 4 feet 6 inches from the centre of *the track* of the right or off wheel to the centre of the track of the left or near wheel. The following are the limitations provided by the act for the number of passengers:—

Four-wheeled coach, drawn by four horses, and not more than 8 feet 9 inches in height, and *bearing* on the ground (measured as before) not less than 4 feet 6 inches—10 passengers outside, exclusive of the driver and guard.

When drawn by two or three horses only, and licensed to carry *not less* than 4 inside passengers—6 outside.

When licensed to carry *not less* than 6 inside passengers—7 outside.

Not more than one outside passenger is to sit on the box with the driver; nor more than three in front; and the same number on the back of the roof; and the remainder are to be placed on some safe and convenient place in the *hind part* of the carriage. An additional passenger is allowed (sec. 40) on each of the seats on the roof, provided they are respectively 5 feet long, and the extreme height of the luggage be not more than 9 feet 9 inches from the ground; and two additional outside passengers are also allowed on *the boot*, if its height be not more than 6 feet from the ground. In case of neglect of any of these provisions, a penalty is imposed on the driver of 5*l.* The part allotted to the luggage must be distinctly separated from the other part of the coach, by a railing or otherwise; and the height of the luggage from the ground must not exceed 10 feet 9 inches in coaches drawn by four or more horses; nor 10 feet 3 inches in coaches drawn by two or three horses. In case any person sits or is carried upon the space allotted to the luggage, both he and the driver are liable to a penalty of 5*l.*

Any passenger travelling by a coach, and also justices, road-surveyors, toll collectors, and constables, may require the driver or proprietor to allow the luggage to be measured, and the number of passengers to be counted; and any passenger may demand of the driver to stop at a toll-gate, and may require the toll-gate keeper to measure the luggage and count the passengers, and to sign a memorandum in writing of the result, which is to be delivered to the passenger, &c. and penalties of 5*l.* are imposed both on the driver and toll-gate keeper for refusal (sec. 45). A penalty of 5*l.* is also imposed on any driver quitting the box before a proper person shall stand at the head of the horses; or permitting any other person to drive; or quitting the box without reasonable occasion; or concealing or misplacing the plates; or discharging fire-arms unnecessarily; or neglecting to take care of the luggage; or asking more than the proper fare; or assaulting or using abusive language to any passenger, or person accompanying or attending upon any passenger, in coming or going to the coach (sec. 47); or endangering passengers or property by intoxication or negligence, or by wanton and furious driving or other misconduct. And the owners or proprietors are liable to the penalties where the guard or driver is not known or cannot be found.

Besides the regulations of the above statute, a coach-proprietor is bound by law to take care that his coach, harness, and horses are *roadworthy*, that is, sufficiently secure to perform the journeys he undertakes: and he will be liable to make compensation to any person injured in consequence of any insufficiency in this respect. A breaking down of the coach, and an accident happening to a passenger, are sufficient to entitle him *primâ facie* to claim compensation against the proprietors, and the burden of proof is then thrown upon them to show that the injury was the result of an *inevitable* accident, and that the goodness of their vehicle and the skill or care of their driver were unimpeachable, in which case they would not be liable.

Proprietors are not liable for the result of an *inevitable accident*, such as the horses being frightened by thunder and lightning; but if the accident be not *inevitable*, it is no excuse for the driver to allege that he kept on the right side of the road if he could have avoided the danger by crossing to the other side; nor is it, on the other hand, proof of the negligence of the driver that the accident happened whilst he was on the wrong side of the road, provided no other vehicle was passing at the time.

II. *The liability of carriers as respects the conveyance of goods.*—Carriers of goods are subjected to a greater degree of responsibility than mere bailees for hire—[BAILMENT]—and that responsibility is much more extensive than it is in the case of injuries to passengers. By the antient custom of the realm (which is part of the common law of this country) a common carrier of goods for hire is not only bound to take goods tendered to him, if he have room in his conveyance, and he is informed of their quality and value, but he is in the same situation as one who absolutely insures their safety, even against *inevitable accident*; he is therefore liable for their loss, though he be robbed of them by a force which he could not resist, on the principle that he might otherwise contrive purposely to be robbed of, or to lose the goods, and himself to share the spoil. There are however three exceptions to this extensive liability, 1st, loss arising from the aggression of the king's *public* enemies; 2d, loss arising from the act of God, such as storm, lightning, or tempest; loss arising from the owner's own fault, as by imperfect interior packing, which the carrier could not perceive or remedy.

As property of large value may be compressed into a small space and transmitted by carriers, they have in modern times endeavoured, by means of notices, to lessen the extensive charge that the common law cast upon them. The notice they were in the habit of giving usually stated in substance that the carrier would not be responsible for goods above a certain value (generally 5*l.*), unless entered and paid for accordingly. After repeated discussions on the effect of these notices in courts of justice, the carriers succeeded in establishing, that they would not be liable in the above circumstances, if they could *prove* explicitly, in each instance, full knowledge on the part of the person sending the goods, or his agent, of this specific qualification of their general liability. But proof of this fact was in all cases most difficult to adduce, and to obviate this hardship the statute 11 Geo. IV. and 1 Will. IV., c. 68, was passed, by which it is enacted that no common carrier by *land* shall be liable for the loss of, or injury to, certain articles, particularly enumerated in the act, contained in any package which shall have been delivered, either to be carried for hire, or to accompany a passenger, when the value of such article shall exceed the sum of 10*l.*, unless, at the time of the delivery of the package to the carrier, the value and nature of such article shall have been explicitly declared. In such case the carrier may demand an increased rate of charge, a table of which increased rates must be affixed in legible characters in some public and conspicuous part of the receiving office; and all persons sending goods are bound by a notice thus affixed, without further proof of the same having come to their knowledge.

The Carrier's Act applies only to carriers *by land*, and the liability of carriers by sea is the common law liability before explained, slightly modified by two statutes; the first of which (7 Geo. II., c. 15) being found inadequate, the 26 Geo. III., c. 86, was passed, by which the liability of owners of vessels for any loss by reason of any robbery or embezzlement, whether by the crew or by strangers, without the privity of the owners, is limited to the value of the vessel and freight. They are also exempted from loss by fire, and from being liable for the loss of gold, silver, diamonds, watches, jewels, or precious stones, by reason of their being secreted or embezzled, unless the owner of the goods insert in his bill of lading, or declare in writing to the master or owner of the vessel, the nature, quality, and value of such articles respectively.

Subject to these exceptions, and also to any special contract that may have been made by a bill of lading or otherwise, a sea-carrier will be liable for all losses, except those occasioned by the act of God, the king's enemies, or the default of the party sending the goods, and he will be liable to losses occasioned by the first, if, by unnecessarily deviating from his direct course, he encounter the danger.

Lien of Carriers.—Upon the general principle that persons who, at the request of their owners, bestow money or labour on goods can detain them until those charges are paid, a carrier can refuse to deliver up goods, which have come into his possession *as a carrier*, until his reasonable charges for the carriage are paid. This in law is called a *particular lien*, in contradiction to a *general lien*, which is a right of retaining goods for the balance of a general account; the latter privilege is possessed by wharfingers and attorneys, but not by carriers.

(Sir W. Jones on *Bailments*; Selwyn's *Nisi Prius*, title *Carrier*; and Chitty on *Contracts not under seal*, title *Carrier*.)

CARRON, a village in the county of Stirling and parish of Larbert, where extensive iron-works were erected in 1767, by a company chartered for that purpose. Carron is situated on the river Larbert, which flows into the Frith of Forth, and is navigable. The village has also the advantage of being not far from the Clyde Canal, which, passing from Edinburgh to Glasgow, communicates with the sea both on the eastern and western coasts. Coal and iron ore abound in the vicinity of the works. In the 'Statistical Account of Scotland,' published in 1792, some details are given respecting the Carron works at that time. There were then about 1000 workmen employed, 320 of whom belonged to a benefit society formed under the auspices of the company. The number of carts for conveying coal and iron ore was 150; the daily consumption of coal amounted to 136 tons: there were five blast-furnaces; sixteen air-furnaces; three cupola-furnaces; four mills for boring ordnance; forges for making bar and sheet iron, anchors, anvils, and a variety of articles; and a mill for grinding clay for fire-bricks. There was one steam-engine which consumed 16 tons of coal in twenty-four hours, and is described as raising 4½ tons of water at a single stroke, and on an average performing seven strokes in a minute. In 1755, the population of the parish was 1864; in 1790, it amounted to 4000; in 1821, to 3491; in 1831, to 4248. For a great number of years the business at the Carron works exceeded that of any similar establishment in Scotland; but others have latterly rivalled, and even surpassed these works in the quantity of iron manufactured. In 1834-5, 8000 tons of iron were made at the Carron works in five furnaces. During the same period the Clyde works and the Calder works, which each possess four furnaces, produced 24,000 tons of iron. At one of these places an additional furnace has since been erected. The early adoption of Neilson's patent hot-blast has given this superiority to the works above mentioned. At the works of Gartsherrie, where it is in use, 9000 tons of iron were made in one year in three furnaces. The sum of 1*s.* per ton is paid by way of licence on each ton of iron made in the furnaces fitted up on Mr. Neilson's principle. In June, 1835, the Carron Company had only one furnace out of five in which this improvement was in operation. In the 'New Statistical Account of Scotland,' it is stated that before the introduction of Mr. Neilson's plan, 8 tons of coal and 15 cwts. of limestone were employed in the manufacture of each ton of iron; and that since 1833, when the hot blast first came into practice, each ton of iron is made with only 3 tons of coal and 8 cwts. of limestone. A saving of more than three-sevenths is effected in fuel in every ton of pig-iron made; coal instead of coke may be used; and with this great saving the iron is of better quality than when the manufacture cost so much more. The price of the best coal for making iron is 4*s.* per ton in Scotland.

CARRONADES are short iron guns differing from other guns, and from howitzers, only in their dimensions and in the manner of attaching them to their carriages; which is by a joint and bolt underneath the piece, instead of trunnions. They derive their name from the village of Carron, in Stirlingshire, where they were first made.

When fired at point blank, their range is about 150 yards; and, at an elevation of 3 degrees, it varies from 660 to 750 yards: this is much inferior to the range of a long gun, but as they throw shells and heavy shot with great effect within the above limits, they are extremely serviceable on land for breaching ramparts of earth, or for enfilading the faces of works; and at sea, in engagements at close quarters. A small extension of the chase surrounds the muzzle, in order to protect the sides and rigging of the ship from the effects of the explosion.

For the dimensions and weights of carronades, see Spearman's 'British Gunner.'

CARROT (in horticulture), the fleshy root of the *Daucus carota*. This kind of esculent is too well known to require any description. For garden purposes there are three principal varieties; namely, the early horn carrot, a small kind used for the earliest crops; the long orange, or Altringham carrot, a very large kind, for ordinary summer and winter use; and the purple carrot, a French sort, remarkable for its deep purple colour and unusual sweetness. The latter is not so much known as it deserves to be; the two others are in common use. Several others, among which is a white kind, are mentioned in seedsmen's lists, but they are of little importance.

Nothing can be easier of cultivation than the carrot, provided the soil is light and free from stones; in stiff or rocky soils it is not worth the expense of growing. The seeds are sown at intervals, from the end of February till the beginning of August; they are lightly raked into the soil, having been previously pressed down with the feet. Some persons mix them with damp sand previously to sowing, in order to separate them from each other, and to render them less liable to be blown about by the wind in consequence of their lightness. When they have come up they require no further care than to be hoed to the distance of about six inches apart, and to be kept free from weeds.

The wild carrot is common on sandy land in England, but its roots are tough and dry, and unfit for food.

CARROT (in agriculture). The large orange carrots, which are the most common for winter provision, are chiefly raised in the fields; and when they can be conveyed to large towns for sale, they are a very profitable crop on light and deep soils. The principal use of carrots is as food for cattle. The orange carrot and its varieties are the most common in England, but the large white and yellow carrots are more esteemed on the continent; they are supposed to contain more saccharine matter, and to produce a greater bulk of nutriment on the same ground. The white carrot also will grow on heavier soils than the orange, and may be sown in spring amongst barley, in the same manner as clover usually is; with this difference, that the roots are taken up before winter, and the land may be sown with winter corn the same year. This is commonly practised in Belgium. The barley amongst which the white carrots are sown is chiefly winter barley, which is reaped early. As soon as the barley is cut, the land is well harrowed to pull up the stubble, the weeds are carefully taken out, and liquid manure is poured abundantly over the surface. The carrots, which were scarcely visible, and of which the tops were cut off in reaping the barley, now shoot rapidly, and where they grow too thick are thinned out by hoeing. By the end of autumn a good crop of carrots is obtained; and if they are carefully forked up, the ground may be sown with rye without any other preparation.

When carrots are cultivated in a regular rotation as a principal crop, they are sown in March on land which has been ploughed to a considerable depth before winter, and has had the benefit of the winter's frost. It is not usual to manure the land, but it is best to sow carrots on land which has been abundantly manured for the preceding crop. If it be thought necessary to improve the land by manure, it must be done with well-rotten dung, which should be ploughed in very deep. Without this precaution the carrots will be apt to *fork*, as it is called; the root being divided will not swell regularly, and instead of being of a fleshy consistence will become fibrous and hard. The best mode of cultivation is to have the land in a moderately rich state and thoroughly pulverized; to sow the seed in drills, at the distance of a foot or more from row to row; to cover it slightly, and as the plants appear, to water them with diluted urine or the drainings of dunghills; to destroy all weeds carefully by the hand and the hoe, and to thin the plants in the rows to the distance of 5 or 6 inches or more, according to the richness and depth of the soil. Although the carrot, when it grows most vigorously, does not throw out any considerable fibres from the upper part of the root, and appears to draw its chief nourishment from its lower end, yet it is a great advantage to keep the ground stirred and light between the rows; for exceedingly minute horizontal fibres shoot out to a considerable distance from the sides of the root, and tend much to increase its size. The seed of the carrot has numerous hooked hairs which spring from the husk, and make the seeds adhere together; on this account carrot seed is usually mixed with earth or sand, and well rubbed in the hand before it is sown. Two pounds of seed are sufficient for an acre if the seed is drilled; it requires double the quantity if sown broad-cast. In this last way very heavy crops are sometimes obtained, but the expense of weeding the carrots by hand is so great that the drilled crops, besides being more certain, are more profitable. Seed which is two or three years old will vegetate, and it is more essential that it should be ripe and heavy than new. Too much care cannot be taken in selecting good seed. The finest and largest carrots should alone be chosen to plant out in spring to produce seed. They will throw out vigorous stems bearing numerous umbels, which, as the florets fade and the seeds ripen, contract into the form of a bird's nest. Those who are curious in the choice of the seed take only such seeds as grow on the outer border of the umbel. The tops of the carrots are frequently cut off before they arrive at the full size, as food for cattle and sheep, who are very fond of it; but this is not a judicious plan; as the loss in the growth of the roots from being deprived of the leaves is much greater than the value of the tops as food, especially if they are cut off repeatedly, which is sometimes done when fodder is scarce. When the plants begin to wither, and the outer leaves to droop to the ground, the tops may be safely mown, and the roots left in the ground. They have then acquired their full growth, and will remain sound in the earth till there is danger from the winter's frost.

The best method of taking up the carrots to store them for winter use is by means of three-pronged forks, such as are used in digging asparagus beds. They should be rather blunt at the point and sides of the prongs, and be stuck into the ground vertically by the side of the rows; by pressing down the handle the carrots come up without injury. The plough is sometimes used after the coulter has been removed; but with all the care of the ploughman, the plough and the horses will cut and bruise many of the finest carrots. Carrots may be kept all winter in dry cellars, if they are protected against the frost. The more common way is to store them with straw in long trenches, like beet. [Beet.] The produce of carrots on good light land is nearly double that of potatoes, and they do not impoverish the land so much. From twenty to forty pounds of carrots, with a small quantity of oats, is a sufficient allowance for a hard-working horse for twenty-four hours. Where hay is scarce, it is a most economical substitute; and where the value of urine is known, carrots are much prized, as they greatly tend to its increase.

In Brittany they have an ingenious method of getting several acres of land trenched by the plough and the spade at the same time, for the growth of parsnips and carrots. The different farmers join to bring as many labourers together as will dig out a furrow as rapidly as the plough can draw it: they divide the whole length of the field equally among them. As soon as the plough has made a furrow, the men trench the bottom of it with their spades nine or ten inches deep, throwing the earth over the furrow slice last turned; on the return of the plough the next slice is turned into the deep trench and immediately covered by the spades as before. Thus an acre is readily trenched in one day to the depth of fifteen or eighteen inches, and all the weeds are buried: carrot or parsnip seed is sown on the surface and slightly harrowed in. The common mode of ploughing in stitches is the most convenient for this operation, as each man will only have to move from one side of the stitch to the other immediately after the plough has passed. But a second plough following in the furrow made by the first will do the work equally well, and at less expense.

If carrots are cut in pieces and steamed, they become more nutritious, and the expressed juice made to ferment affords by distillation a very good and wholesome spirit. Sugar may also be extracted; but the carrot is inferior to the beet in this respect.

CARSTENS, ASMUS JACOB, a distinguished German artist, no less remarkable for his enthusiastic perseverance, than for his singular mode of study, and the peculiar bent as well as force of genius, was born at St. Gürgen, near Schleswig, May 10th, 1754. His father was a miller, in no more than decent circumstances; but his mother, who was the daughter of an advocate at Schleswig, had been exceedingly well-educated, and was therefore able to bring up her three sons in a manner very superior to what the circumstances of the family would otherwise have allowed.

After his father's death, which happened when he was about nine years old, Asmus was sent to the public school at Schleswig, where he made little or no progress; but in the cathedral, which soon became his daily haunt, he had an opportunity of examining the pictures there, by Jurian Ovens, a pupil of Rembrandt, and on these, to him miracles of the pencil, he would gaze in boyish ecstasy day after day, with unabated admiration. To be able to achieve such works appeared to him the noblest object of human ambition. His mother readily seconded his inclination, and on his quitting school at the age of sixteen, applied to a painter named Geeve to take him as a pupil; but the sum demanded was much greater than could prudently be afforded. A second application of the same kind was then made to Tischbein, of Cassel, an artist of great reput[illegible] his day, but with no better success.

His mother soon after died, and the guardians of the children and of their little property, obstinately refusing to listen to Asmus's earnest entreaties, placed him with a wine-merchant at Eckernforde. With a kind of hopeless resignation, he at first determined to dismiss all his former aspirations after art, and to apply himself to his new duties; but those aspirations soon revived again in all their force, and he employed the whole of his leisure time, and frequently a considerable portion of the night, in drawing. Fortunately his master did not oppose pursuits which he thought might keep him from worse amusements. About this time, too, Carstens renewed his acquaintance with Ipsen, a young painter whom he had known at Schleswig, from whose instructions he obtained some insight into the management of colours and other technical matters. He likewise attentively studied whatever books he could procure relative to art; among others Webb on Painting, to which he owned himself principally indebted for correct and worthy notions respecting it. Having served five years, he purchased out the remaining two of his apprenticeship, and proceeded to Copenhagen, where he again met with Ipsen, who procured for him free access to the Royal Gallery of Paintings, and to the collection of casts and antiques at the academy. These latter more particularly attracted him, and he was assiduous in studying them; not however by making any drawings from them, but merely by examining them again and again from every possible point of view, so as to impress them, even in all their minutiæ, ineffaceably upon his memory; owing to which process, he was, according to his own assertion, able at any time to recall their perfect images before him. Whilst he was thus daily acquiring a fund of real knowledge in his art, although making no very visible progress in it, and in fact hardly exercising himself with his pencil beyond one or two essays at composition, his finances rapidly decreased; he therefore endeavoured to support himself by taking likenesses in red chalk, and was so fortunate as to be thus enabled to continue his usual studies for two years longer, during which he produced his 'Balder's Death' and 'Æolus and Ulysses,' compositions that excited much notice, and would have obtained for him admittance into the academy, had he not given offence on a particular occasion. But having thus closed against himself the road to favour, he determined upon leaving Copenhagen and going to Rome along with his youngest brother (who had also been studying painting at Schleswig) and the sculptor Busch. Accordingly, they set out in the spring of 1783, and Carstens and his brother travelled on foot as far as Mantua, their companion having parted from them at Nuremberg. After passing an entire month at Mantua, where he was filled with admiration of Giulio Romano's works, Carstens found that they must abandon their plan and return homewards. They accordingly set out again northward, passing through Switzerland, and stopping for a short time at Zurich, where Gesner assisted Carstens in disposing of his drawings: and with the sum thus opportunely raised, the brothers were enabled to reach Lubeck. Here he was glad to take up with his former occupation of portrait-painting, which he pursued for nearly five years; but he employed all the time not so occupied in making historical and poetical compositions. He also now began for the first time to read diligently all the best translations of the antient poets, and those of Ossian and Shakspeare; and in this course of study he was greatly benefited by the advice and literary taste of his friend and biographer Fernow, with whom he happened about this time to become acquainted. The course of reading he had taken up expanded his mind and quickened his imagination, and the fruits of it shortly began to manifest themselves in a number of compositions from Homer, the Greek tragedians, and other great masters of poetry, both antient and modern. With his exceedingly moderate desires, confined to the mere necessaries of life, Carstens might, as far as worldly advancement was concerned, have been content with his situation at Lubeck, and even have accounted himself rich in the intellectual enjoyments at his command, had he not felt that, so long as he continued there, he was in a state of exile, and cut off from the hope of being able to produce any works of magnitude; gratefully therefore did he accept the generous offer of Rodde, a wealthy amateur, who furnished him with the means of visiting Berlin.

In that capital he had at first to contend with many difficulties, for he had resolved to practise portrait-painting no longer, but to occupy himself entirely with historical subjects. But opportunities not presenting themselves, after a time he became reduced to the greatest straits, and was obliged to make designs for book-prints. At length, his 'Fall of the Angels,' a large composition containing upwards of 200 figures, obtained for him an appointment as one of the professors at the academy, and the following year a considerable gratuity was added to his salary. His pressing difficulties would not allow him to reject this piece of good fortune; otherwise he might have hesitated to accept it; but he regarded it chiefly as the means of obtaining a travelling pension to Rome, which he was now more than ever desirous of visiting. He had become acquainted with the architect Genelli, who was then just returned from Italy; and what he learned from him served only to increase his desire. Fortunately, at the recommendation of Genelli, he was employed to decorate the walls of a saloon in the Dorville palace with a series of mythological subjects. When the work was completed, it was viewed by the king, to whom Carstens was introduced as the artist, by the minister von Heinitz, the proprietor of the mansion. This interview at once obtained for him the promise of a travelling pension, and in the summer of 1792 he again set out for Rome. He travelled through Dresden and Nuremberg, making some stay at the first place for the purpose of visiting the Gallery of Antiques and that of pictures; and at the latter, in order to become acquainted with the works of Albert Durer, whom, after Michael Angelo and Raphael, he held to be one of the greatest masters in his art. He did not, on the contrary, estimate very highly what he had beheld at Dresden, and was greatly disappointed in the productions of Mengs, which, in his opinion, display extraordinary talent and no genius.

Arrived at Rome, Rome for a long time existed to him only in the Vatican. His first object was to imbue himself thoroughly with the spirit of Michael Angelo and Raphael, to catch, if possible, their modes of thought, and to trace their conceptions to their source. Highly wrought up as his expectations had been, he found them here surpassed, and that their works were instinct with a mental power, of which no copies or engravings had before conveyed to him any idea. Hardly could he afterwards persuade himself that he was in the same Rome which contained such consummate master-pieces, when he began to visit the studios of living artists; instead of meeting with powerful rivals or able companions in the same track he was pursuing, he found himself quite alone and insulated from those around him, both in his notions of art, and in his enthusiasm for it. Ambitious littleness, affectation, empty theatrical display, artificial colouring, and mere manual dexterity of the pencil, were in his opinion the leading characteristics of the living school. Neither did he at all attempt to disguise his opinion, or to conceal that he considered the system of study pursued to be one altogether injurious, and calculated only to bolster up imbecility. Much of the defectiveness he discerned was ascribed by him to the constant use of the model, which, he maintained, was not studying nature, but a substitute for it.

The severity of his principles of criticism obtained for him not a few enemies; and they more than insinuated that he could not perform what he exacted from others. He soon convinced them of the contrary, by a large drawing representing the visit of the Argonauts to the centaur Chiron, a subject he had before produced at Berlin, but which he now recomposed, and in a style that plainly indicated how much he had already benefited by studying Michael Angelo and Raphael.

The two years, to which his stay at Rome was limited, having expired, he begged hard for a little longer extension of the term, as he was preparing to make a public exhibition of the subjects which he had produced while in Italy. He was in fact determined if possible to establish himself in the city of the Vatican, the real academy for those who know how to avail themselves of it; and he trusted that this exhibition would enable him to do so, though his pension, as was likely, should be withdrawn. His exhibition was opened in April, 1795, and consisted of eleven subjects, mostly poetical and mythological, and few of them ever before treated. None of these compositions were oil pictures, for Carstens was aware that colouring was not his forte, and that, had he produced them as such, his enemies would have dwelt loudly upon their defects as paintings, overlooking all positive merit of a much higher kind than manual execution; he therefore wisely chose to submit them to the public in that shape which was best calculated to compel attention to the poetry of his conceptions, to the power of his imagination, the dignity and simple grandeur of his style.

The result proved his foresight: both in style and subject these works were an earnest of powers as superior as they were uncommon; and the artist's fame was soon spread through Germany by an article on the exhibition, in Wieland's 'Mercur.' The same year he sent three compositions to Berlin, whereupon he was again urged to return to his post in the academy; but instead of its being complied with, this demand was followed by remonstrance and re fusal on the part of Carstens. The consequence was that he cast off his dependence on the Berlin academy altogether. In the course of the two following years he produced many fine compositions, including a series of twenty-four subjects from Pindar, Orpheus, and Apollonius Rhodius, all of them illustrative of the Argonautic expedition. This series it was his intention to etch himself, but in the autumn of 1797 he was attacked by a serious malady, which was succeeded by a slow fever and an obstinate cough, whereby he was so enfeebled that he was unable to employ his pencil except for a very short interval in the day. Yet even after he was incapable of quitting his bed, his wonted enthusiasm and energy did not forsake him; and but a few hours before his death he conversed with his friend Fernow respecting a mythological subject which had suggested itself to him. He expired on the 25th of May, 1798, when he had just entered his forty-fifth year.

Thus may Carstens be said to have been prematurely cut off just as he had begun his career as an artist, for it can hardly be dated earlier than the time of his visiting Rome, which was not until he had reached the age of thirty-eight. Up to that period, all that he had been able to do was little more than to acquire preparatory knowledge, and that under such unfavourable and disheartening circumstances, attended with so many interruptions and obstacles, that nothing short of almost unexampled enthusiasm could have enabled him to surmount them. To art he gave himself undividedly; his whole soul was in it, so that although he had not mastered some things that lie more on the surface, he had dived into its depths and recesses. His originally defective education only stimulated him to greater self-exertion, and to cut out for himself a way through the barriers that opposed his progress. At the same time, much that seemed against him was in reality in his favour; his utter seclusion from general society and its interests preserved to him a generous simplicity and elevation of mind which effectually secured him from the artificial and conventional, and caused him to entertain those lofty ideas of art which, if they do not always inspire, ennoble inspiration where it exists. Specious cleverness, bravura of style, external showiness of composition, and the plausible mastery of execution, could not impose upon or satisfy him, if higher intellectual qualities were wanting. He considered that by far too much stress was generally laid upon the mere accomplishments of his art, and that the attention paid to the mechanical part of it had been one great cause of its declension. What he chiefly valued was creative power, intelligence, and mind, of which he regarded external forms merely as the expression. Conformably with such opinions and theory was his own practice. His compositions, which he was in the habit of completely shaping out, maturing, and finishing up mentally, before he committed them to paper, are all marked by a severe simplicity and fine poetic conception; and had a longer life and health been granted to him he would doubtless have left behind him works commensurate in other respects with their intellectual value, and which would have acquired for him universal fame. Admirable and even wonderful as his productions are in themselves, they being chiefly drawings, it is not very surprising that they should be comparatively little known, since only few can have the opportunity of inspecting them, and fewer still of thoroughly studying them as they deserve; whereas had the same compositions been given to the world as pictures on the usual scale of historical painting, they would have enjoyed extended celebrity, and placed the name of Carstens almost next to those of the two great masters whom he strove to emulate.

CART. The drag-cart without wheels, which is used in some mountainous districts, is one of the simplest contrivances for transporting heavy weights. It consists of two strong poles, from twelve to fifteen feet long, connected by cross pieces fixed at right angles to them, by morticing or pinning, so that the poles may be two or three feet apart. About eighteen inches of the poles project beyond the lowest cross piece, the ends resting on the ground. The other ends of the poles form the shafts for the horse to draw by. The load is placed on the cross pieces, over which boards are sometimes nailed, for the purpose of carrying stones, or such things as might fall through between the cross bars: it then resembles the body of a cart taken off the wheels. The horse bears one end of the drag cart by a strap over his back, and drags it or by means of a common cart collar or a breast strap. This vehicle is extremely useful in steep and rough descents, especially to draw stones from quarries, and can be made of rough poles at little or no expense. Pieces of hard wood fixed under the ends of the poles, and renewed as they wear out, will prevent the ends of the drag cart from wearing away, and will allow it to slide along more easily.

The Irish car (*fig.* 2) may be considered as the next step towards a better construction. This car consists of a bed or platform and two shafts. The wheels, in the simplest form, are round disks of wood made by nailing planks two or three inches thick over each other, so that the fibres of the wood in one plank shall lie at right angles to those in the other. They are then sawn into the form of a circle, and an iron tire put on the circumference. Two of these disks are fixed on a square axle of wood at the distance of three or four feet from each other. The ends of the axle, which project three or four inches beyond the wheels, are then rounded in the form of cylinders of two or three inches diameter. To the under part of the bed of the cart two blocks of wood are fixed, which raise it so that the wheels may go under the cart, and in these blocks are two round holes to admit the ends of the axle. Two strong nails or iron pins driven obliquely into the blocks, after the wheels are put under, serve to prevent the axle from slipping out. A little grease on the ends of the axle diminishes the friction, and prevents the disagreeable grating of the wood when the wheels turn round. This is the simple old Irish car. The only difference in the construction of the most improved modern cars is the substitution of neat wheels, and iron axles for those described above, and a railing or box fixed on the platform. The great simplicity of the Irish car, its easy construction, and the convenience of the platform to place the load on, are its greatest recommendations. It is well adapted to narrow mountainous roads; and the wheels being quite under the bed, there is less danger when two cars meet, or among trees and rocks; especially when one man has the charge of several cars, or the horses are permitted to find their way home by their own sagacity. There is a considerable inconvenience in turning, as the wheels do not turn separately, and one of them must be dragged along, while the other forms the centre round which the car turns. In the improved jaunting cars, the wheels are made to turn separately on the axles, by which this inconvenience is obviated. The wheels of the carriages on railroads are constructed on the principle of those of the Irish car. The axle turns with the wheels in a bush or box fixed to the carriage. This gives greater facility for keeping a constant supply of oil to the box by means of a fixed reservoir: and the carriage not being required to turn round, no inconvenience arises.

Fig. 1.

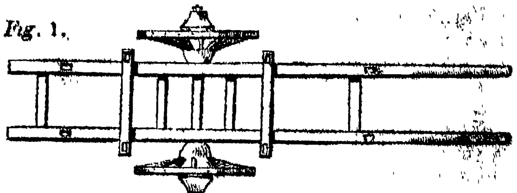


Fig. 2.

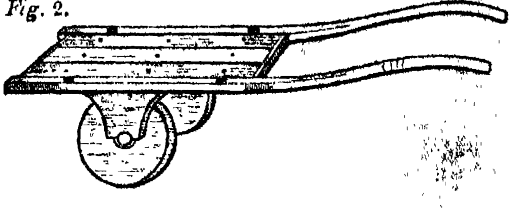
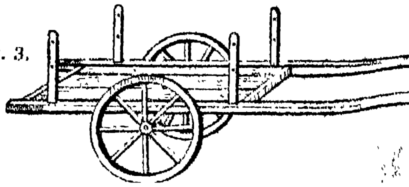


Fig. 3.



The common cart differs from the car in that the body rests on a fixed axle between the wheels, which turn upon the axle by means of boxes in the centre of the naves. The simplest cart is that used by carriers in France and Germany. (*Figs.* 1 *and* 3.) It consists of two strong poles of ash or beech, resembling those of the drag-cart described above, but stronger, and fashioned with more care, so as to have considerable strength at the place where they rest on the axle-tree. One end forms the shafts, and the whole is equally poised on the axle. The wheels are often nearly six feet in diameter, and narrow at the tire; they are slightly dished, but run nearly perpendicularly to the road. On these carts very great weights are transported, so as to require five or six horses to draw them. On paved roads they may have some advantages, but there is much loss of power when many horses draw at length, and the horse in the shafts is often much distressed by the weight suddenly thrown on his back, and by the striking of the shafts against his sides. It would be impossible for the shaft-horse to bear the weight in going down steep descents, or to keep his footing up steep hills (however well the cart may be poised), if it were not for an ingenious contrivance, by which the load is shifted at pleasure backwards or forwards on the axle. In ascending, the centre of gravity is moved nearer to the horse, and, in descending, farther back, so as to be always nearly perpendicularly over the axle. Another contrivance is a mode of retarding the motion of the wheels in descending. This is done by forcing a pole against the outer rim of the wheel, one end being fixed to the shafts of the cart, and the other drawn, by means of a rope, tightly against the side of the wheel, which rubs hard against it. The object is thus obtained, but the wheels are soon worn away, and the pole requires to be carefully looked to, because it often wears through and breaks, when the whole load comes suddenly against the horse and throws him down. Another equally rude and extremely noisy mode is to cut a tough branch, a little longer than the distance between the wheels, and place it horizontally between the spokes, so that it projects about an inch or two on each side. The wheel, in turning round, bends the branch until the ends escape from one spoke and strike the next; thus a constant retardation of the wheel takes place at the expense of the spokes, which are soon worn out. A better contrivance is a piece of wood or iron in the form of a small segment of a circle, of the same diameter as that of the wheel, which is made to press more or less on the rim of the wheels by means of a lever to which it is attached. It is regulated by a screw turned by a winch, which gives the exact pressure requisite to overcome the downward tendency of the load, and may be so nicely adjusted that it requires only a slight exertion in the horse to draw the cart down. By some of these contrivances many of the inconveniences arising from the use of carts are obviated. Where the roads are level and hard, waggons are much to be preferred to carts; but in hilly countries and bad roads, carts have many advantages.

For agricultural purposes, various kinds of carts have been invented. The capacious tumbril for carting earth and dung, with broad wheels to prevent their sinking in soft ground, is too generally known to require description. The best constructed carts have iron axles with the ends or arms turned smooth, and very slightly conical. The boxes in the naves of the wheels, which receive the arms, are made of cast iron, and ground smooth, so as to require only a small quantity of grease or oil to make the wheels run easily, without allowing any play or side motion. It is usual to give the axle a bend at the place where it enters the wheel, by which means the planes of the wheels are made to diverge from each other and give more room for the body of the cart. But this is decidedly wrong. It is clearly proved that the draught is least when the arms are quite horizontal, and if the wheels are slightly dished, that is, if the spokes are driven into the nave obliquely so as to throw the rim a little beyond the perpendicular, the lower spokes in each wheel will slightly diverge, and give greater steadiness to the whole. When the axle is bent, the rim of a broad-wheeled cart must be slightly conical, in order that it may rest flat on the ground: and it is easily proved that in this case the [illegible] is dragged on the road at every revolution, along a space equal to the difference between the greater and lesser circumference of the rim of the wheel, giving unnecessary work to the horses, and greatly injuring the roads. The light Scotch cart, drawn by one horse, is justly considered as the most advantageous for transporting earth, lime, or dung, especially in hilly countries. It is low and short, so that the horse draws very near the centre of gravity; and there is little power lost by obliquity. The loads may be so adjusted as to bear more or less on the horse, according to the declivity; and experience has proved that more weight can be transported by a given number of horses, when each is attached to a single Scotch cart, than when three or four draw together, except it be on very level and hard roads, or when the horses move at a quick pace. The objection made to single-horse carts, that each requires a man to drive it, is obviated in Scotland, where the horses are trained to follow each other, and one man can attend to several carts and horses. In England this is not allowed on the roads for fear of accidents.

The Scotch cart is made to carry hay and straw by means of a light frame, which is laid on it, and projects over the body and the wheels in every direction. At harvest it is found to collect the sheaves of corn and carry them to the stack or barn more rapidly than could be done by a waggon. A good horse will walk faster, when he has a load on his back, than he could do if he were merely drawing; and although this exertion, if continued long, would exhaust him, he soon recovers his breath, if he has only been urged for a small distance, and then returns with a light empty cart.

To avoid the weight resting on the back of the horse, carts have been invented with three wheels, the small additional wheel being made to turn in front. It is only in the case of moving earth down a declivity, and returning with the empty cart, that it has any advantage over the two-wheeled cart; it is therefore seldom used for general purposes. The additional wheel adds to the weight which the horse has to draw, and is an incumbrance in a ploughed field.

The addition of springs to carts and waggons is a very great improvement, and should be adopted in every case where they are much used on the roads. The additional weight of the springs and their cost are greatly overbalanced by their advantage: they lessen the draught, and, by preventing jolting and shaking, add to the durability of the vehicles. Where a light active kind of horse is used which can trot with a moderate load, it will be found that there is a great advantage in occasionally increasing the pace at which empty carts and waggons are made to move. In Holland and Flanders, the waggons are always driven at a smart trot when going empty to the field in harvest or hay-making, and much valuable time is saved by this means.

CARTAGE'NA, CARTHAGO NOVA of the antients, a seaport town on the Mediterranean, in the province of Murcia in Spain, in 37° 36′ N. lat., and 1° W. long. It is said to have been built by Hasdrubal Barcas, who gave it the name of New Carthage, and intended it for the metropolis of the Carthaginian possessions in Spain. The Romans after their conquest of Spain sent a colony to it, and called it Julia Nova Carthago. It now forms with its territory a partido or district of the province of Murcia, and has military and political governor, and an alcalde mayor, or judge of the second class. Appeals lie before the royal chancery, or higher court of Valencia. Cartagena is one of the three naval stations of Spain: it has a royal dock-yard, a fine basin, a gun wharf, a castle, and a baguio for the galley slaves. The harbour is large, one of the best in all Spain, and the safest of all on the East or Mediterranean coast. It has 30 feet water close under the walls of the town. It is defended by batteries at the entrance, and by several forts and redoubts on the surrounding hills. The town is regularly built, and has some good streets and buildings, four parishes, and 29,500 inhabitants, including the suburbs. (Miñano, *Diccionario Geografico de España.*) It has been however for more than half a century past in a state of decay, owing to the political troubles and the interruption of its trade with the Spanish-American colonies. It has some manufactories of cloth for sails, of cables and ropes, and other articles for shipping. The country around produces corn, wine, oil, and barilla; in the neighbouring mountains are mines of lead, and it is believed also of silver; the latter were worked in the time of the Carthaginians and Romans, but are now abandoned. The large and curious cave called Cueva de San Juan, which abounds with rich crystals and pyrites, is believed be one of these old mines. Cartagena is 27 m. S. by E. of Murcia, and 20 m. W. of Cabo Palos.

CARTAGENA, a seaport in the republic of New Granada, on the northern shore of South America, in 10° 25′ 48″ N. lat., and 75° 30′ W. long., about 50 miles from the mouth of the Rio Maddelena.

The harbour of Cartagena is one of the safest and most convenient in all America. It is formed by two islands extending along the coast S. and N. The most S. island, called Tierra Bomba, is about two miles long and wide, and between it and the Cape Baru is the narrow entrance of the port called Boca Chica. The N. island is on an average hardly half a mile wide, and low, whilst Tierra Bomba rises to a moderate height. The entrance of the port is so narrow that only one vessel can enter at once, and as some sand-banks occur in it a pilot is always required. It is defended by two strong castles. The harbour itself is about six miles long; its width varies from two to four miles. It has a sufficient depth of water and good anchorage, and its surface is as little agitated as that of a river.

On the N. island and at the most N. corner of the harbour is situated the town, on a sandy tract of land. It occupies the whole width of the island, so that its N.W. walls stand on the beach of the open sea, and the S.E. on the harbour. To the E. of the town is another low island, on which the suburb, called Xiximani, stands: both are connected by a wooden bridge. Another bridge unites the suburb with the mainland.

The town is regularly built, with straight but rather narrow streets, which are still more narrowed by the projecting balconies, so that they nearly exclude the daylight, and give the town a gloomy aspect. The houses have commonly two stories, but their exterior resembles a convent, having only one or two windows towards the streets, and these generally small. These buildings include a fine open space in the middle, on which lofty and airy rooms open, and which is surrounded by a corridor. The town is well fortified, and on the land side surrounded by several fortresses; but it is commanded by a hill called Popa, which is not fortified, and on which a convent stands.

Among the public buildings are several fine churches and seven convents. The immense cisterns situated within the walls of the town are justly admired by travellers, and the water preserved in them is excellent: otherwise the water is bad, which circumstance, united to the great heat of the climate, produces frequent diseases among the lower classes. The yellow fever often makes great ravages.

The inhabitants, who amount to between 18,000 and 20,000, are mostly people of colour, descendants of Spaniards and Indian women: but there are also individuals who derive their origin partly from Africans. The majority are sailors and fishermen, but many are shopkeepers and mechanics, and the latter show that in some trades they are not deficient in talent. Their jewellery and shell-works are excellent.

The commerce of this town was formerly considerable. Merchant vessels, sent from Spain, waited here till their return cargoes had arrived at Panamà, when they sailed to Puerto Bello, where they took them in, and came back to Cartagena before their return to Europe. But since the revolution in South America the commerce of this town is limited to exporting the produce of the valley of the Rio Magdalena and importing the manufactured goods which are consumed in it. The more wealthy inhabitants frequently resort to the village of Turbaco, which is about 12 miles distant, and more than 1000 feet above the level of the sea, to avoid the great heat in summer. Foreigners are attracted to this place to see the *vulcanitos*. From a swamp situated at a short distance from Turbaco, in a forest of palm-trees, rise about 20 hillocks to the height of 20 or 30 feet. They have the form of cones, and on their summit is a crater filled with water. From these craters there are eruptions at certain intervals, in which gas is evolved, and which are attended with a throwing up of muddy water. (Juan and Ulloa's *Travels*: Humboldt and Mollien.)

CARTE, THOMAS, was born in April, 1686, at Clifton in Warwickshire, of which parish his father, the Rev. Samuel Carte, was vicar. He matriculated at Oxford, but took his degree of master of arts in the University of Cambridge, and afterwards entered into holy orders, and was attached to the cathedral of Bath.

Carte's opinions were very strong in favour of the Stuart family, and his zeal brought on him some suffering. On the accession of George I., he declined to take the oaths of allegiance, and therefore abandoned the priesthood: in 1715 he was obliged to conceal himself lest he should be apprehended as participating in the rebellion; and in 1722 he was so strongly suspected of being concerned in the conspiracy of Bishop Atterbury (whose secretary he was), that 1000*l.* was offered for his apprehension, and he fled to France, where he resided nearly twelve years under an assumed name. Again, in 1744, he was arrested under a like suspicion of favouring the expected descent of the Pretender. He died near Abingdon, in 1754.

So far as great labour and indefatigable research constitute an historian, Carte may lay claim to that character. His works consist of an edition of 'Thuanus,' in 7 vols., fol.; a 'Life of James, Duke of Ormonde,' in 3 vols. fol.; and 4 vols. fol., of the 'History of England,' bringing it down to the year 1654. Besides pamphlets and some minor works, he likewise published at Paris a Catalogue, in French, of the Gascon, Norman, and French Rolls, preserved in the Tower of London. His manuscripts are preserved in the Bodleian Library at Oxford.

CARTE-BLANCHE (literally, white card) is a paper signed and, if necessary, sealed by the party against whom it is to be used, but (with the exception of the signature and seal) blank; in order that it may be filled up with such conditions as the party to whom it is delivered may prescribe. Thus when Charles I. was about to be condemned, his son, Prince Charles, sent to the parliament a blank paper signed and sealed by himself, in order that they might dictate their own terms for saving his father's life.

The term is often used to express an unrestricted authority delegated by one man to another: thus a general is said to have carte-blanche from his sovereign when he has leave to carry on the warfare at his own discretion.

CARTER, ELIZABETH, was the daughter of Dr. Nicholas Carter, an eminent Latin, Greek, and Hebrew scholar, one of the six preachers in Canterbury Cathedral, and perpetual curate of Deal in Kent, where his daughter Elizabeth was born December 16, 1717. Her mother, a Dorsetshire heiress, of the name of Swayne, was supposed to have shortened her life by repining over the loss of her fortune, which had been invested in the South Sea Stock. Elizabeth was educated by her father, who made no distinction between her and her brothers. Though slow at first, she afterwards made rapid progress in the learned languages, to which she added Italian, German, Spanish, and French: she acquired the last in the house of a Protestant refugee minister, and the three former by her own exertions. Her proficiency in these studies did not lead her to neglect needle-work, music, or the other accomplishments common to her sex. Mrs. Carter's earliest productions appeared in the 'Gentleman's Magazine,' under the signature of Eliza. In 1738 she published some poems in a very thin 4to volume, which were succeeded in the year following by a translation of some strictures, by Crousaz, on Pope's 'Essay on Man.' In the same year she translated from the Italian of Algarotti, 'An Explanation of Newton's Philosophy, for the use of Ladies, in Six Dialogues on Sight and Colours.' These publications, appearing before their author was twenty-two, gave her immediate celebrity, and brought her into correspondence with most of the learned of that day. Among others may be mentioned Bishop Butler, the author of the 'Analogy,' Dr. Benson, bishop of Gloucester, and Archbishop Secker; Dr. Johnson, Sir Joshua Reynolds, and Burke. In the midst of her literary occupations, she undertook the task of entirely educating her youngest brother for the university, and performed it so as to merit the encomium of his examiners upon his admission. During her intervals of leisure she translated Epictetus, not with a view to publication, but for the amusement of her friend Miss Talbot, to whom the sheets were sent as they were finished, and shown to Archbishop Secker, who took an interest in the progress of the work. In compliance with the wishes of her friends, she sent her translation to the press, and on its publication the literary journals at home and abroad were full of her praise. Dr. Johnson availed himself of her pen for a paper (No. 44.) for the 'Rambler.' Of her learning he thought so highly, as to say, when speaking of an eminent scholar, that 'he understood Greek better than any one whom he had ever known except Elizabeth Carter.' This learned lady was never married. She lived to the advanced age of eighty-nine, having died in 1806, leaving behind her a character adorned by finer qualities than even those of a highly cultivated understanding. (Pennington's *Memoirs*.)

CARTERET, PHILIP, a naval officer, who commanded the Swallow, which sailed August 22, 1766, on a voyage of discovery to the South Seas, under the orders of Captain Wallis, who sailed in the Dolphin. The Swallow being a bad sailer, the two ships were unable to keep company, and were at last parted in a gale of wind. Captain Carteret's voyage may therefore be considered as a separate expedition, and several interesting geographical discoveries were the result.

He arrived in England Feb. 20, 1769, after an absence of two years and a half. An account of his voyage is given by Dr. Hawksworth in the introduction to his 'Narrative of Captain Cook's First Voyage.'

CARTES, DES. [Des Cartes.]

CARTHAGE, MAGNA CARTHA'GO, called by the Greeks Carchedon (Καρχηδών), an antient city and state, long the rival of Rome, was a colony of the Tyrians, and was built, according to tradition, about 100 years before Rome. There seems to have been an older Phœnician settlement on the spot, which, according to Appian and others, was founded before the siege of Troy, and hence much confusion has arisen concerning the age of Carthage. Most antient writers agree in following an old story or tradition, that Carthage was founded by Elissa or Dido, whose husband being murdered by his brother-in-law Pygmalion, king of Tyre, fled with many attendants and other citizens, and landed on a peninsula on the coast of Africa, between Tunes and Utica, which were older Phœnician colonies. She purchased or agreed to pay rent for a piece of ground to build a town upon, which was called Betzura or Bosra, *i.e.* the castle, a name which the Greeks altered into Byrsa, 'a hide.' The name of Byrsa, and perhaps the shape of the peninsula, which resembled an ox hide, gave rise to the well-known fable of the manner in which the unsuspicious Libyans were cheated out of their ground. As the town increased, the inhabitants excavated a port, which was called Cothon, and became a great maritime and commercial emporium. This is the part of the town which Dionysius and Velleius Paterculus say was built 60 years before Rome, 813 B.C. The Magara or Magalia, which was like a great suburb with fine gardens, probably owed its name to the first Phœnician habitations, called Magar, or Magalia in the language of the country.

Of the early history of Carthage during more than three centuries we know little or nothing, except that it became a great commercial and maritime state. What we know of its institutions is derived chiefly from a chapter in Aristotle's Politics, in which he speaks of its government as one of the best constituted in his time, having never yet been subject to popular commotions or exposed to the attempts of tyranny. If Aristotle's work on Constitutions were not lost, we should probably have a much fuller account of the Carthaginian government and social state.

The government of Carthage was municipal; and the city ruled over all the rest of the country. The constitution was a mixed aristocracy. The chief authority was vested in the senate, which appears to have been a numerous body composed of the principal citizens. It was not an exclusive aristocracy, nor essentially hereditary, but was recruited out of the class of the more wealthy citizens, or those who had rendered great services to the state. Whether it supplied its own vacancies, or some other mode of election was resorted to, is not known. The senators appear to have been for life. The senate contained within itself a select body or council of state, which the Greek writers call Gerusia. Aristotle (*Politica*, ii., 20) says the Carthaginians had a body of 104 magistrates, similar to the Ephori of Sparta, but selected with greater discernment from among the most worthy; and that the kings and the Gerusia of Carthage resembled the kings and the Gerusia of Sparta in their respective offices. Justin says that the Gerusia was a select body chosen from among the senators to watch over and investigate the conduct of the magistrates, and especially of the generals returning home from foreign command, and that it was first established at the time when the house of Mago, by its vast influence and popularity, excited fears of some ambitious designs (about 400 B.C.). It answered therefore to the Spartan Ephori, or to the Council of Ten at Venice, though it was much more numerous, for the Carthaginian Gerusia is said to have consisted of 100 members. Two attempts at establishing tyranny were actually made,—one by Hanno, 340 B.C., and the other by Hamilcar, 306. They both failed, and their authors suffered death. This 'Council of the Hundred' is also mentioned by Aristotle as forming the highest magistracy, and deciding all causes. It was probably the same as the 'Council of 104.' The Council were also guardians of the public morals, and, like the other civil magistrates, received no salary. The members, according to Aristotle, were elected by the Pentarchies, an institution of which we know nothing more than that they managed the principal affairs of the state, that they continued in office for a long time, filled up their own vacancies, and that no one was admitted into them who had not previously served the state in some official capacity. From their name it would appear that they were bodies composed of five individuals each. It is probable that they were permanent committees of administration chosen from among the senate.

Two Suffetes, probably Shophetim or judges, like those of the Hebrews, and whom the Greek and Roman writers call kings, appear to have been at the head of the executive; they presided in the senate, and laid before that assembly their reports on public affairs. Aristotle says that the main difference between them and the kings of Sparta was that the office of the former depended upon election, while that of the kings of Sparta was hereditary in two families. Cicero (*De Republica*) compares the suffetes to the old kings of Rome, and contrasts them with the annual consuls of the Roman Republic. It would seem therefore that the suffetes were for life, and that we might compare them to the Doges of Venice. Of their mode of election we are ignorant. The election of the generals and foreign governors, which was the next office to that of suffete, took place in the Gerusia, but was afterwards referred to the senate and the people for their approbation. A suffete was at times general also, and as such headed the armies of the Republic, while his colleague remained at home. The generals, called strategos by the Greek historians, were distinct from the boetharchs, or civil governors. When the senate and the suffetes could not agree upon some particular points, the question was referred to the people or citizens at large for their decision. Of the mode of assembling the citizens and taking their votes we are ignorant, as well as of the other occasions in which they participated in the political power. It seems however that the citizens were consulted on important occasions, concerning peace or war, &c. The magistrates were either elected by the people or proposed by the senate, and approved by the people, and Aristotle observes that bribery was resorted to, and that offices were bought and sold at Carthage. Aristotle speaks of dinners given by various societies, probably like our clubs, in which political questions were discussed. Livy speaks of their political circuli, clubs, or *cercles* as they are now called in French. It is also said that they held their meetings and councils at night time. Aristotle observes that in the choice of magistrates the qualities required were their wealth, their personal character, and merits, and their popularity, which shows that the people had a real power in the elections. Upon the whole it would appear that the constitution of Carthage resembled that of Venice previous to the great council or patrician body of the latter republic being made exclusive and necessarily hereditary, by the Doge Gradenigo in 1297, by the famous decree called 'La Serrata del maggior Consiglio.' Some people have drawn a fanciful parallel between Carthage and England; but this is a very superficial view of both states: Carthage never had an extensive compact territory with many millions of an homogeneous population like Great Britain; its armies were almost entirely composed of mercenaries, and there are besides numerous other discrepancies between the two countries and their respective institutions.

Of the private and domestic manners of the Carthaginians we know very little. Being a great commercial and maritime community the people must have been busy, and have been at least comparatively free from the vices and depravity resulting from idleness. We hear of no gladiators' fights or other barbarous pastimes in Carthage as at Rome. Their punishments however were severe, and even cruel. Crucifixion was the most common mode of death. We may gather from Polybius, Appian, and others, that conjugal and parental feelings were strong among them. There was, as we have said, a censorship of public morals, and there is reason to believe that sumptuary laws also existed. The magistrates during the time of their office were required to abstain from wine. All these circumstances bear favourable evidence in favour of Carthaginian manners, at least in the earlier part of their political existence. Their religion or mode of worship, which was originally gloomy and cruel, they derived from Phœnicia. Melcarth, 'king of the city,' was their tutelar deity, and was perhaps the same as the Melec or Moloch, to whom they immolated the children of the noblest families to propitiate his wrath, until the cruel practice was abolished by the treaty with Gelon of Syracuse. Astaroth or Astarte, the goddess of the moon, was another of their deities. They had also on the summit of Byrsa a magnificent temple sacred to Æsculapius. We hear of no sacerdotal caste possessing exclusive influence at Carthage. This subject has been investigated by the late Dr. Münter, bishop of Zealand in Denmark, in his *Religion der Karthager;* Copenhagen, 1821.

Although a people essentially commercial, the Carthaginians were remarkably attentive to agriculture, and their wealthy citizens used to employ their surplus money in the cultivation and improvement of their estates. The country in the neighbourhood of Carthage, and indeed all that tract which formed its real territory, and which corresponds to the present state of Tunis, was beautifully cultivated and extremely fertile. When Agathocles landed in Africa, and when Regulus, half a century later, Scipio Africanus, half a century later still, and Scipio Æmilianus, another half a century after that, invaded the Carthaginian territory, their march lay through rich fields covered with herds of cattle, and irrigated by numerous streams; vineyards, and olive grounds were spread on every side, innumerable small towns and villages were strewed over the country, and as they drew near to the 'Great Carthage' the neighbourhood was thickly studded with the country seats of the wealthy citizens. Mago, a suffete of Carthage, who is supposed by some to be the same as the head of the powerful family of that name, who flourished about 550 B.C., wrote a work on agriculture in 28 books, which is the only work mentioned as having been carried away by the Romans out of the libraries of Carthage when they destroyed that city, and which was translated by D. Silanus, but is unfortunately lost. Varro, Pliny, and other Roman writers have borrowed considerably from this work, which they quote with great praise. We are told by Polybius that the Carthaginians derived their public revenue from the taxes paid by the provinces.

The foreign policy of the Carthaginians was grasping, jealous, and often inhuman. This policy however dates from the time when Carthage became a conquering nation, which was in the fourth century of its existence, when the sons of Mago invaded Sardinia and Sicily. Before that event they seem to have contented themselves, like their Phœnician progenitors, with trading both inland and by sea, and establishing factories on the western coasts of the Mediterranean for carrying on an exchange trade with the natives. They early took possession of the smaller islands near their own coasts, such as Melita or Malta, Gozo, Lampedósa, and afterwards of the Balearic and the Lipari islands. The Baleares produced wine, oil, and fine wool, and Malta was celebrated for its cloth manufactures.

The intercourse of the Carthaginians with their mother country Tyre seems to have been very closely maintained. We read in Josephus (*Cont. Apion.*, lib. i.) that they sent assistance to the Tyrians when besieged by the king of Babylon about 600 years B.C., and afterwards when Tyre was besieged and taken by Alexander the Great, the Carthaginians afforded a refuge to some of their unfortunate fellow countrymen. Their policy and their old enmity towards the Greeks, originating perhaps in commercial rivalry, led them to enter into correspondence with the Persian kings, especially at the time when Darius and Xerxes invaded Greece. They also joined the Etruscans at an early period against the Phocæans, who had settled in Corsica, and afterwards the Ligurians against the Phocæan colony of Massilia (Marseilles), by which however they were defeated at sea, and precluded from forming establishments on the coast of Gaul.

Mago was the first who introduced military discipline, and made Carthage a conquering nation. He is said to have freed his country from the tribute or rent which they still paid to the Libyans for the original ground on which they built their city. As Mago however lived in the fourth century after the building of Carthage, it is not likely that the people of that city had till then confined themselves to the original grant of territory. We know that it was their policy to establish colonies among the Libyans, by means of which a mixed race was formed, called by Polybius Libyo-Phœnicians, as distinguished both from the pure Phœnicians of Carthage, Utica, and other maritime towns, and from the Nomades or Numidians of the interior. These Libyans, among whom the Carthaginians settled, were husbandmen, or became such by the example of their guests; they had fixed habitations, and they are evidently the same whom Herodotus mentions as living north of the lake Tritonis, and distinguishes from the Nomadic Libyans. He calls them by the names of their tribes, the Maxyes, Zaueces, Zygantes, &c., which they still retained in his time, but which afterwards became obliterated as the populations amalgamated themselves with the Carthaginian colonies, and made altogether one body of subjects of that republic. In the time of Herodotus they were apparently in the first stage after their transition from their aboriginal wild state to that of permanent agriculturists.

The real territory of Carthage seems to have extended southwards as far as the lake Tritonis, and W. not much beyond the frontiers of the present state of Tunis, for we know that Cirta, the modern Constantina, was the capital of an independent Numidian kingdom. But even in the tract of territory which may be considered as belonging to Carthage there were along the coast several old Phœnician colonies, such as Utica, Leptis, Hippo, Hadrumetum, which appear to have stood in the relation of allies to Carthage, retaining their municipal independence. But the political influence and indirect sway of Carthage extended much farther inland over many tributary native chiefs, and it had settlements all along the N. African coast, eastwards as far as the Philænorum Aræ, on the boundary of Cyrene, in the most southern recess of the Great Syrtis, and westwards as far as the pillars of Hercules. Diodorus mentions various nations who inhabited North Africa,—the Phœnicians or Carthaginians along the coast, the Libyo-Phœnicians, who inhabited part of the territory subject to Carthage, and especially the district of Byzacium, the Libyans Proper, who spoke a different language from the Punic, and the Nomades or Numidians.

The first foreign conquest attempted by the Carthaginians seems to have been that of Sardinia, under one Malchus, perhaps Melech, who failed: it was renewed by Hasdrubal and Hamilcar, the sons of Mago. Hasdrubal, of whom we are told that he had been eleven times general, fell in battle in Sardinia; but his brother Hamilcar succeeded in reducing part of the island, where the Carthaginians built the colonies of Caralis and Sulci. It was about this time, 490 B.C., that Darius, according to Justin (xix. 1), sent an embassy to Carthage, requesting assistance against the Greeks, which the Carthaginians declined furnishing. About 480 B.C. Hamilcar was sent to Sicily with a great force, which has been probably exaggerated by Diodorus, who states it at 300,000 men. This was the first attempt of Carthage to conquer that fine island, and it was made at the instigation of Anaxilas the tyrant of Messana, and of his son-in-law the tyrant of Himera, who being expelled his country had taken refuge at Carthage. The Carthaginians landed at Panormus, which, as well as Soluntum and Motya, were old Phœnician settlements, and moved thence to besiege Himera. Gelon, the tyrant of Syracuse, the assistance of the place, and by a stratagem surprised the Carthaginian camp, killed their commander Hamilcar, set fire to the ships, and totally defeated their army. The whole Carthaginian force was either destroyed or taken prisoners. Herodotus says that the battle of Himera happened on the same day as the battle of Salamis. On the news of the defeat the senate of Carthage sent messengers to Gelon to request peace, which Gelon granted, on condition that Carthage should pay 2000 talents and send to Syracuse two ships completely equipped, and also that the Carthaginians should abolish the cruel practice of sacrificing human victims to Melcarth. The Carthaginians, overjoyed with the peace they had thus obtained, made a present to Demarata, Gelo's wife, who had favoured its conclusion, of a crown of gold of the value of 100 talents. There was after this a period of 70 years of peace, during which Carthage seems to have reached the highest point of its commercial prosperity. It was during this time that it sent two fleets to explore the western coasts of Africa and Europe. The first was commanded by Hanno, a Suffete, perhaps the Hanno son of Hamilcar, who had died in Sicily. He took out with him 30,000 colonists, of the rural population, whom he distributed in six settlements on the W. coast of Africa. For particulars of this celebrated expedition see HANNO. The other expedition under Himilco (there was another son of Hamilcar of the same name) was sent round the coast of Lusitania and northwards as far as the Œstrymnon Cape, which some suppose to be Cape Finisterre. But the only information that we have concerning this voyage is derived from Festus Avienus's poem, who says (how truly is a question) that he wrote it from the Punic annals: his account is extremely confused and perplexing. It seems that the Carthaginians had discovered not only the Fortunate or Canary Islands, but Madeira also. A large island with rivers and forests is mentioned, the position of which they kept concealed as a state secret, intending it as a place of refuge in case of some great national catastrophe. Some have fancied from this that they had discovered part of America. (Heeren, *Researches into the Commerce and Policy of the Carthaginians*; Lelewel, *Die Entdeckungen der Carthager und Griechen auf dem Atlantischen Ocean*.)

The second Carthaginian expedition into Sicily took place about 410 B.C. The people of Egesta or Segeste, being oppressed by those of Selinus, applied to Carthage for assistance. Hannibal, a Suffete of the house of Mago, sent messengers to Syracuse to request their joint mediation between Selinus and Segeste, but in reality to sound the opinion of that state, the most powerful of Sicily. But the Syracusans, who were distracted by civil factions, answered that they should remain neutral. The Carthaginians then sent first a small force to relieve Segeste, and afterwards landed a much larger force, with which they besieged Selinus. In this siege they employed moveable towers and battering-rams. After a desperate defence Selinus was taken, plundered, and burnt. They next took Himera, which they treated in a like manner, 3000 prisoners being slaughtered to appease the manes of Hamilcar. The next attack was on Agrigentum, which was also taken 406 B.C. [AGRIGENTUM.] When the Carthaginians attacked Gela, Dionysius the elder, tyrant of Syracuse, interfered, and a series of wars began between him and the Carthaginians, which, with some interruption by truces, lasted till the death of Dionysius. [DIONYSIUS.] The wars were renewed under Timoleon [TIMOLEON], who at last made peace with Carthage, by which the territory of the latter state in Sicily was limited to the west extremity of the island, the river Halicus, between Selinus and Lilybœum, forming its eastern boundary. War broke out again between Carthage and Syracuse about 310 B.C., when Agathocles was tyrant of the latter city. It was on this occasion that a large fleet, intended for Sicily, soon after leaving Carthage, was dispersed by a storm, in which sixty galleys and 200 transports were lost. The loss was felt to be so great, that the walls of Carthage were hung with black, as in times of great national calamity. It is a remarkable fact that the Carthaginians, although by profession a maritime people, were singularly unlucky in storms and naval fights. They however assembled an army in Sicily, and totally defeated Agathocles, 309 B.C., who resorted to the bold attempt of carrying the war into Africa. This was the first deadly thrust at the power of Carthage, whose weak point being thus discovered, the example was afterwards followed by the Romans. [AGATHOCLES.]

After the death of Agathocles, Pyrrhus, who had married his daughter, came over to Sicily to oppose the Carthaginians. He overran their territory, and took all their towns, except Lilybœum. Pyrrhus however returned to Italy, and the Syracusans elected Hiero for their commander. Hiero began by attacking the Mamertines, a body of Campanian mercenaries who had served under Agathocles, but being dismissed after his death, had gone to Messana, where, after being kindly received, they suddenly fell upon the citizens, killed or drove them all away, and took possession of their houses, wives, and property. Being hard pressed by Hiero, they applied to the Carthaginian naval commander, who was stationed at Lipara. The Carthaginians came and took possession of the citadel. The Mamertines afterwards revolted against them, and applied to Rome for assistance against both Hiero and the Carthaginians. This gave rise to the first contest between Carthage and Rome, 265 B.C. [PUNIC WARS.]

The result of the first Punic war, which ended 242 B.C., was that Carthage lost Sicily and the Lipari islands. This war was followed by another, nearly as destructive to Carthage. The mercenary troops who had served in Sicily, and had been disbanded in Africa after the peace, without being paid their full stipend, rose under two chiefs, devastated the territory of Carthage, threatened the city, and carried on the war for several years, until Hamilcar Barcas, who had already distinguished himself in Sicily in the latter period of the war against the Romans, succeeded in subduing or rather destroying the mutineers. Polybius calls this the Libyan war, and he gives a detailed account of it. It was attended with circumstances of the greatest atrocity on both sides. Indeed the Carthaginians, who employed chiefly mercenary troops, though always commanded by Carthaginian officers, could not rely upon the attachment of these soldiers, and they seem also to have been wantonly prodigal of their blood, and often unjust to them, when they stood no longer in need of their services.

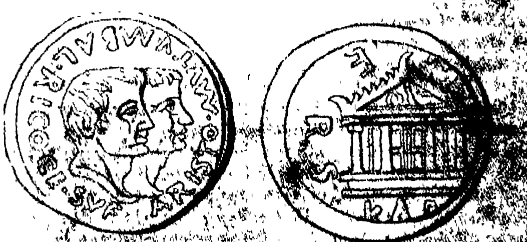
After the end of the war of the mercenaries, of which the Romans took an unfair advantage by seizing upon Sardinia, and driving away the Carthaginian garrison, Hamilcar Barcas was sent over to Spain. That skilful commander turned all his thoughts to establishing the power of Carthage over that rich country, and thus gaining a compensation for the loss of Sicily and Sardinia. It was before setting off for Spain that he made his son Hannibal, then a boy nine years old, swear on the altar eternal hatred against Rome.

It does not appear that the Carthaginians held any extent of territory in Spain before Hamilcar's time, though they had factories on the south coast. The inhabitants of Gades, an old Phœnician colony, connected with Carthage by common descent and commerce, had asked assistance against some native tribes, and this had probably furnished a pretence for the first Carthaginian settlements on that coast. During nine years that Barcas remained in command in Spain, he extended the dominion of Carthage over the south and east part of that country, and founded the town of Barcino or Barcelona. These conquests of course were not effected without much oppression of the natives, and we are told that Hamilcar remitted large sums to Carthage in order to strengthen the influence of his party in the senate and among the people, which were then divided between two rival factions, that of Barcas and that of Hanno, each taking the name of the leading family. Hamilcar was killed in a battle against the natives (Appianus, *De Reb. Hispan.* v.), and was succeeded by Hasdrubal, his son-in-law, who took young Hannibal as his colleague. The Saguntini, who are said to have been a colony from Zacynthus, being pressed on all sides by the Carthaginian conquests, sent deputies to Rome for protection. The Roman senate sent deputies to Carthage, and a treaty was concluded, by which the river Iberus (Ebro) was to be the limit of the Carthaginian possessions in Spain, and moreover the Saguntini and other Greek colonies south-west of the Iberus were to remain free and independent. Hasdrubal some time after was killed by a native while hunting, and Hannibal, then twenty-six years of age, was proclaimed his successor by the army, a choice which was confirmed by the senate of Carthage.

He began his command by the siege of Saguntum, which led to the second Punic war, 218 B.C. [HANNIBAL.] By the peace (201 B.C.) which terminated that memorable contest, the power of Carthage as an independent state was entirely annihilated. Besides the large sums they had to pay, the Carthaginians gave up Spain, and all their other settlements beyond Africa; they delivered to the Romans all their ships of war except ten triremes, and all their elephants, and they bound themselves not to carry on war in or out of Africa without the permission of Rome. Massanissa the Numidian king remained as a watchful and interested trustee for the execution of the latter condition. The sequel of the history of Carthage presents but a melancholy picture of the humiliation and decline of a once powerful state. The Carthaginians kept the treaty faithfully; they bore patiently during half a century with the imperiousness of Rome, and the annoyances of its ally, Massanissa, until the latter seized upon an extent of territory called Tysca, with fifty villages upon it, within the Carthaginian boundary Fossæ Punicæ, as fixed by the first Scipio. They then complained to Rome, which sent a commission, of which Cato the elder was one. That ruthless inflexible old man inspected every part of the great commercial city, and being astonished at the sight of its still remaining wealth and magnificence, persuaded himself that nothing but its ruin could insure the dominion of Rome. Hence his well known burthen to the senate on his return, 'Delenda est Carthago.' Some of the Roman senators however, and Scipio Nasica among the rest, men of more enlarged views, were for moderate and conciliatory measures. Scipio Nasica himself was next appointed commissioner to arbitrate between Carthage and Massanissa. He went to Carthage, and had nearly settled all controverted points, when Gisco, a Carthaginian demagogue, roused the populace to assault Scipio, who was obliged to save himself by flight.

Carthage, like all commonwealths in their decline, was distracted by factions; one party was favourable to Rome, another to Massanissa, and another, with Gisco and Hasdrubal at their head, called themselves the popular or national party. The friends of Massanissa were exiled by the popular party, and Gulussa, the son of Massanissa, who had come to Carthage to negotiate, was not allowed to enter the gates, and on his way back his escort was attacked by a party of Carthaginians, and some of his men were killed. Massanissa, who was then nearly 90 years of age, invaded the territory of Carthage. The Carthaginians opposed force to force, and Hasdrubal was appointed commander. While the two armies were fighting, Scipio Æmilianus, son of Paulus Æmilius, and grandson of Scipio Africanus by adoption, arrived in Massanissa's camp on a mission from Spain, where he was then serving. The result of the fight was unfavourable to the Carthaginians, who retreated to their camp, in which they were blockaded by Massanissa. Being reduced by famine, they were obliged to surrender, give up their arms, and pass under the yoke; after which, as they were marching on, exhausted and broken-spirited, towards Carthage, Gulussa fell upon them with his Numidian cavalry, and made a frightful slaughter. Hasdrubal, the commander, escaped, but being condemned to death as a traitor or coward, he collected the runaways and many outlaws, and formed a body of 20,000 marauders, who lived at discretion in the interior of the country. The city of Utica, an old Phœnician colony, to save itself from the impending storm, sent deputies to offer itself to the Romans. Rome declared war against Carthage, 149 B.C., under the pretence of its having violated the treaty by defending itself against Massanissa. The consuls Marcius Censorinus and Manlius Nepos were appointed to the command of the fleet and of the land force; and they received secret orders from the senate not to desist from hostilities until Carthage was destroyed. The Carthaginians, overcome by so many calamities, having lost their army, and being without ships, allies, or mercenaries, sent deputies to Rome with full power to make peace at any cost. The deputies were referred by the senate to the consuls, who had then arrived in Sicily, and who would prescribe to them the conditions, by fulfilling which Carthage should preserve its laws, its liberty, and its territory. Having repaired to the consul's station at Lilybœum, they were required to deliver as hostages 300 young men of the first families of Carthage. This being complied with, the consuls sailed for Utica, where, having landed their troops, they encamped at the old Castra Scipionis. They then gave a public audience with great pomp and state to the Carthaginian deputies, who appeared as suppliants before them, and were required to give up all their arms, as they had no more occasion for them, the Roman people taking them under their protection. The arms were delivered to the number of 2000 catapultæ, 200,000 complete armours, besides an immense number of spears, swords, bows and arrows, &c. This being done, the deputies waited to hear the final sentence. The consuls then signified to them that Carthage must be razed to the ground, but that the inhabitants might rebuild their houses any where, provided it were 10 miles distant from the sea, and there were no walls or fortifications. The scene that followed, first in the Roman camp, and afterwards within Carthage, on the return of the deputies, is well described by Appian. The indignation of the citizens at the base treachery of the Romans overcame all considerations of prudence or personal safety. They determined on defence, and the third Punic War began. It lasted only three years, and ended with the utter destruction of Carthage, 146 B.C. The horrors of that siege, the desperate resistance of the Carthaginians, the self-devotedness of their women, are described by Appian. Of 700,000 people who lived within Carthage, only 50,000 surrendered to Scipio and were saved. By a decree of the Roman senate, every part of the city was razed to the ground. The destruction of a great commercial city, the first in the world at the time, previously resolved upon in cold blood, after fifty years of peace, and without any fresh provocation, and against a defenceless people, who had thrown themselves entirely upon Roman generosity, was one of the most brutal acts of Roman policy. To Africa the destruction of Carthage was a retrograde step in civilization, for there was never afterwards a native power in that part of the world that could be compared to Carthage. The Carthaginian colonies beyond the pillars of Hercules were forgotten, and the key to their [illegible] and extensive trade was lost. The literature of Carthage likewise perished; the Romans gave its libraries to their Numidian allies, and we know, through Sallust (*De Bello Jugurth.*) that king Hiempsal had a collection of Carthaginian historians, from which Sallust derived some information on the early history of Africa. Pliny mentions a collection of African chronicles compiled by Juba, and extracted from Punic, Libyan, Greek, and Latin authorities; this work, however, is lost.

About 30 years after the destruction of Carthage, the Gracchi attempted to establish a colony on its ruins; but the settlement made little progress until Julius Cæsar, and Augustus after him, sent colonies to build a new town, which was called Colonia Carthago. It stood on the S.E. part of the peninsula, between Cape Carthage and Goletta, and occupied but a comparatively small part of the ground of the old city. Pliny called it 'Colonia Carthago Magna in vestigiis Carthaginis.' It rose, however, to considerable splendour, had its cothon or harbour, and became the first city of Roman Africa. In Christian history it is known for its councils and for the spiritual labours of St. Augustine. In 439 A.D., it was taken by the Vandals under Genseric; it was retaken by Belisarius in 533; and lastly was taken and destroyed by the Saracens in 698. Thus ended the second Carthage, after an existence of about seven centuries. The ruins which are now seen on that coast belong to the Roman Carthago; there are no remains of the Tyrian city, except the large cisterns and perhaps the ruins of the great aqueduct. It seems probable that the old or great Carthage occupied the N. part of the peninsula, between Cape Cammart and Cape Carthage, where substructures are still seen under water; and it perhaps extended also to the S.W. of Cape Cammart, where the whole appearance of the land is changed since the time of old Carthage. The gulf between Cape Cammart and the point of Porto Farina went much deeper inland than it does [illegible] The alluvia of the Bagradas, and the sands raised up by the N.W. winds which prevail on this coast, have filled up this space for several miles. The shape of the peninsula of Carthage is completely altered; the isthmus, three miles broad, which was formed by the lake of Tunis on one side and the gulf above mentioned on the other, is now obliterated on the latter side by the main land, which has formed itself along side of it, extending N.W. to the spot where Scipio's camp once stood. The lower course of the Bagradas is also altered. The river at one time entered the sea nearer Carthage than it does now; it stood between Carthage and the Castra of Scipio, whereas it now enters the sea on the other or N. side of the Castra. The remains of Utica are now several miles from the sea-shore. (See the topographic map of Carthage in Shaw's *Travels.*) It is possible that the cothon or harbour of the Tyrian Carthage opened into the gulf, which is now filled up, to the leeward or S.W. of Cape Cammart. As for Byrsa, there are several hillocks which may answer to it, as it was not the only hill within Carthage. Megara, which was a suburb with spacious gardens, extended probably over a great part of the [illegible] la. The most recent and accurate investigation on the site of the Tyrian Carthage is contained in Estrup's *Lineæ Topographicæ Carthaginis Tyriæ*, with a map, 1821. Estrup was a Danish scholar, who made use of the MSS. of Camillo Borgia, a Neapolitan traveller, who had examined the ground attentively, and who died at Naples without being able to publish his work. See also E. Stanley's *Observations on Tunis and Cape Carthage*, 1786. For the commerce and colonies of Carthage, the reader may refer to Heeren's *Researches*, and the authorities there quoted; and for its political history, to Bötticher's *Geschichte der Karthager*, 1827.



[Brit. Mus. Actual Size. Copper.]

CA'RTHAMUS TINCTO'RIUS, a pretty annual plant, found wild in Egypt and the Levant. It has an erect cylindrical stem, branching near the summit, a foot or two high, and furnished with sharp-pointed oval, sessile, somewhat spiny leaves. The flowers grow in heads, enclosed in a roundish spiny involucre; the florets are of an orange-yellow, becoming red when dried. These latter contain a colouring principle called Carthamite, which is employed by dyers as the source of some of the more delicate rose-colours, and the rich scarlet called ponceau; it also constitutes the basis of the cosmetic known by the name of rouge.

The dried flowers of carthamus are exported in great quantities from Egypt, and are very like saffron to the eye, on which account they have been employed to adulterate that drug; and the plant itself has acquired the name of bastard saffron, or safflower. M'Culloch states that 2772 cwt. of this article was imported in 1831.

CARTHUSIANS. The Carthusian monks were a branch of the Benedictines, whose rule, with the addition of a great many austerities, they followed. Bruno, who was born at Cologne in Germany, first instituted the Order at Chartreux, in the diocese of Grenoble in France, about A.D. 1080; whence the monasteries of the Order, instead of Chartreux-houses, were in England corruptly called *Charter-houses*. The rule of the Carthusians, which is said to have been confirmed by Pope Alexander III. as early as 1174, was the most strict of any of the religious orders; the monks never eating flesh, and being obliged to fast on bread, water, and salt one day in every week: nor were they permitted to go out of the bounds of their monasteries, except their priors and procurators, or proctors, and they only upon the necessary affairs of the respective house.

The Carthusians were brought into England in 1180 or 1181, by King Henry II., almost as early as their establishment at Grenoble, and had their first house at Witham in Somersetshire. Their habit was all white, except an outward plaited cloak, which was black. Stevens, in his Continuation of Dugdale's Monasticon, says there were but five nunneries of this austere order in the world, and but 167 houses of these monks. In England there was no nunnery, and but nine houses of this order. These nine houses were at Witham and Henton in Somersetshire, the Charter-house at London, Beauvale in Nottinghamshire, St. Anne's near Coventry, Kingston-upon-Hull, and Mountgrace in Yorkshire, Eppworth in the Isle of Axholm, and Shene in Surrey. Licences for two or three other houses were obtained at different times, but they do not appear to have been established.

Dugdale has given the statutes of the order from a MS. in the Cottonian library, marked Nero A. iii. Some constitutions made at a general chapter of the order held in 1411, are also preserved in the Cottonian MS., Calig. A. ii. fol. 139. The Cottonian MS., Nero A. iii., besides the statutes of the Order already mentioned, contains the oaths of those who entered the Carthusian order, with the graces which were used both before and after dinner and supper.

(*Histoire des Ordres Monastiques*, vol. vii. p. 366; Tanner, *Notit. Monast.*, edit. Nasm., p. 9; Dugdale's *Monasticon*, new edit. vol. vi. pt. i. p. 3.)

CARTILAGE, commonly called gristle, a substance intermediate in density between the membranous and bony structures of the body. It is distinguished from every other texture by its pearly whiteness, its smoothness, its firmness, and its great elasticity. When divided it appears to be perfectly homogeneous, without fibres and without laminæ; but when examined after prolonged maceration, it is manifest that it possesses a fibrous structure. The component fibres are inferior in firmness only to those of bone; they are so brittle, that if forcibly bent they give way and break, and yet they are endowed with a high degree of elasticity. They are united by cellular tissue so exceedingly condensed, that it can be distinguished from the cartilage itself only after protracted maceration or long-continued boiling. The nutrient arteries of cartilage are so minute that they are incapable of admitting the red particles of the blood; but that they admit the finer particles of the nutritive fluid is manifest from the new matter which is deposited during growth, and from the yellow colour which the cartilage assumes in jaundice. No lymphatic can be detected in cartilage; but the presence of lymphatic vessels in it is demonstrated by the absorption that takes place in cartilage in the process of ossification, and in the progress of many diseases. No nerve is visible in this substance to the eye, but the pain induced in it by disease proves that it is not destitute of nerves. Homogeneous as this substance appears, it is truly organised, containing every constituent which enters into the composition of organic structures.

Chemically considered, cartilage appears to consist of condensed albumen combined with a small portion of earthy phosphate; its chemical composition thus showing its close relation to bone. According to Dr. Davy, 100 parts of cartilage consist of albumen 44·5, water 55·0, phosphate of lime ·5.

Cartilage is not only closely allied to bone in the mechanical arrangement of its component fibres and in its chemical composition, but it sometimes supplies the place of bone, as in the fœtus and in young persons. Cartilages of this class, which regularly disappear as ossification advances, are called temporary, in contradistinction to the permanent, which remain during all periods of life. Permanent cartilages either cover the extremities of the bones in the moveable joints or articulations, and are thence called articular; or are attached to the extremities of the ribs, and are thence termed costal. The articular cartilage consists of a layer of the same shape as the extremity of the bone which it covers, varying in thickness from one or two lines to the fraction of a line, and over its external or free surface there is always reflected a fine and delicate membrane termed the synovial, which secretes the fluid by which the joint is lubricated and its free and easy motion secured, denominated synovia or joint oil.

The costal cartilages, which are cartilaginous productions of the osseous ribs, are much larger and thicker than the articular, assist in the formation of the thoracic cavity, and perform a very important part in the function of respiration.

The distinctive property of this peculiar form of organised matter, to which the name of cartilage has been given, is elasticity, on which depends the specific use of this substance in the economy. It is mainly an adjunct to bones, counteracting certain evils which, but for the intervention of some substance of this kind, must necessarily have resulted from the hard unyielding nature of the osseous fibres. Covering the extremities of bones, or interposed between layers of bony fibres, without in the least diminishing the firmness and strength of the osseous fibres, it enables the bones to yield in the shocks to which the body is exposed in the ever-varying movements of the frame, defends them from fracture and displacement, and at the same time protects the great centres of the nervous system, the spinal chord and brain, from the concussions and jars to which these tender and delicate organs would, but for its interposition, have been constantly exposed. (Bostock's *Elements of Physiology*; Grainger's *Elements of General Anatomy*; and Southwood Smith's *Philosophy of Health*.)

CARTMEL. [LANCASHIRE.]

CARTOON, from 'carta,' *paper*, 'cartone,' *large paper*, Ital.; a word used by artists to signify the full-sized drawings or studies made in chalks, or body-colour (*tempera*, as it is called in Italy), preparatory to executing any great work either in oil-colour or fresco. Cartoons are also made when the design is to be copied in tapestry.

The preparation for making cartoons is very simple: several sheets of paper are pasted together at the edges, and then strained on a frame of the size required. Sometimes the surface is *primed*; that is, washed with a general colour or ground, but more frequently the paper is left in its natural state, and the drawing is made either in chalks or, as above stated, in *distemper*. When only two colours are used, as black and white, or brown and white, it is called 'in chiaro 'scuro,' *i. e.* light and shade. The cartoon being finished, it is transferred either by laying it upon the canvass on which the picture is to be painted, and tracing the lines through with a hard point (powdered charcoal, or black lead, or chalk being first rubbed on the back of it, or on paper placed between it and the canvass), or lines are drawn over it perpendicularly and horizontally at equal distances; and exactly corresponding lines or squares being made on the canvass, the parts of the cartoon are carefully copied into them, and the colouring is then commenced. The injury which the drawing of lines over it might do to the cartoon may be avoided by straining threads across it from pins at the required distances round the frame. In *fresco* painting the plaster on which the work is to be executed must be wet, and only a small portion can therefore be completed at a time; the transfer of the cartoon is effected here in small compartments, either by tracing as much as the artist means to finish, or by pricking the lines through.

The great masters seldom commenced any extensive picture without first making studies or cartoons in *chiaro 'scuro.* Many of those by Raffaelle, And. Mantegna, Domenichino, the Caracci, and others, remain to attest the laborious diligence and care with which their great works were accomplished. By this means the composition, drawing, expression, and light and shade, were all perfected before the colouring of the picture was attempted, and as these may be said to constitute the highest qualities of art, the schools that chiefly attended to them, viz. the Roman, Florentine, and Bolognese, are eminently distinguished for their *grand style.*

The finest specimens of cartoons that are known are those executed by Raffaelle d'Urbino, which were sent to Flanders, in the reign of Pope Leo X., to be copied in tapestry, in two sets. One was intended for the decoration of the pontifical apartments in the Vatican: the other as a present from the pope to Henry VIII. of England. The tapestries (only shadows of Raffaelle's exquisite designs) were finished, and one set is now in Rome. The other was in England till the death of Charles I., when it was purchased and carried to Spain by the Spanish ambassador.*

The cartoons, originally twenty-five in number, were left neglected at Brussels, and most of them seem to have been lost or destroyed. A few however escaped this fate, and seven are now in England in his Majesty's collection at Hampton Court. Their history, even since their arrival in England, is eventful. They were bought in Flanders by Rubens for King Charles I. At the dispersion and sale of the royal collection the cartoons were secured to the country by purchase, by Cromwell's particular command: at which time, we are told, the triumphs of Julius Cæsar by Andrea Mantegna (still preserved at Hampton Court) were valued at 2000*l.*, while the cartoons of Raffaelle were estimated at only 300*l.* In the reign of Charles II they were again consigned to neglect. They had been sent to Mortlake to be copied in tapestry, where they were seriously injured. William III. had them repaired, and built a gallery at Hampton Court for their reception. George III. removed them to Buckingham Palace, and subsequently to Windsor Castle. They were again removed to Hampton Court, where they now are.

The cartoons represent the following striking subjects from the New Testament:—

Paul preaching at Athens.
The Death of Ananias
Elymas the Sorcerer struck with blindness.
Christ delivering the keys to St. Peter.
The Sacrifice at Lystra.
The Apostles healing the Sick in the Temple.
The Miraculous Draught of Fishes.

Precluded by our limits from entering at length into the merits of the cartoons of Raffaelle, we would still earnestly direct the attention of our readers to these noble creations of genius. They will be found to possess all the qualities that dignify art. In the first place, they display the greatest judgment in the artist in the selection of his subjects, and equal skill in the manner of treating them. The compositions are in the highest degree masterly, and the stories intended to be illustrated are told with the greatest perspicuity. In the details they exhibit every variety of character and expression; the mild sublimity of our Saviour, the quiet dignity of the Apostles, admiration, doubt, surprise, pain, fear, down to the careless innocence of childhood, are all pourtrayed with a master's hand. The women are the most perfect delineations of grand female beauty, and the children, wherever they are introduced, are models of infantine grace and simplicity. In the arrangement of drapery Raffaelle was unrivalled, and the cartoons offer the finest examples of excellence in this respect. These exquisite works cannot be too often nor too carefully studied by those who desire to form a pure and elevated taste in design. The cartoons above specified have been engraved by Dorigny, Audran, and Holloway; there are also engravings of a greater number than those in the English collection, some of which are taken from the tapestries; of others it is believed the originals no longer exist. Five from tapestries represent the Adoration of the Kings—Christ appearing to Mary Magdalen—The Disciples at Emmaus—The Murder of the Innocents—The Ascension. Others are described by Fea, in his 'Descrizione di Roma,' and Somereau, a French artist, engraved them, with the whole series, in 4to.

Two large cartoons by Raffaelle are in the possession of the duke of Buccleugh; and two, said to belong to the set sent to Flanders, are in the king of Sardinia's collection. There was a tapestry from a cartoon by Raffaelle, representing The Descent of Christ to the Fathers, in Limbo, which the Abbate Fea tells us was destroyed by fire. It was engraved by Nic. Beatricetto, and described by Braun. For some further interesting particulars on this subject, the reader is referred to 'Istoria della Vita, &c. di Raffaello Sangio del Sr. Quatremère de Quincy,' with ample notes by its translator (into Italian), Francesco Longhena: 1 vol., Milano, 1829. Lord Francis Egerton has, at Bridgewater House, two very fine cartoons in black chalk, by Annibale Caracci. They are studies for parts of the decoration of the Farnese Palace in Rome, and offer examples of the free and grand style of design which characterised this artist's pencil.

CARTWRIGHT, EDMUND, was born April 24, 1743, at Marnham, in the county of Nottingham. His family was antient and highly respectable, and had suffered in its fortune on account of its attachment to the cause of Charles I. Edmund Cartwright received the early part of his education at Wakefield, and being intended for the church, he afterwards went to University College, Oxford, and was elected a Fellow of Magdalen College. He afterwards held the living of Brampton, near Chesterfield, and subsequently he removed to the living of Goadby-Marwood in Leicestershire. He wrote some poetical pieces at an early age, some of which were printed anonymously. In 1770 he published in his own name a legendary poem, entitled 'Armine and Elvira,' which was received with much favour, and soon passed through several editions. He wrote also the 'Prince of Peace' and 'Sonnets to Eminent Men.' He was for a considerable time a contributor to the 'Monthly Review.' The duties of his calling were besides varied by a literary correspondence with several eminent individuals.

In the summer of 1784, during a visit at Matlock, happening to meet with several gentlemen from Manchester, the conversation turned upon the subject of mechanical weaving. Dr. Cartwright's attention had never been directed to mechanical inventions, but though in his fortieth year, the impulse which his mind received from this accidental direction of its powers, enabled him, by the following April, to bring his first power-loom into action, which, though an extremely rude machine, soon received many valuable improvements. Its first introduction was opposed both by manufacturers and their workmen, owing to various prejudices; and a mill containing 500 of his looms, the first which had been erected, was wilfully burnt down. In 1813 there were not more than 2300 power-looms in the United Kingdom. In fact, when first introduced, and before various improvements were made in it, the machine was scarcely equivalent in its results to manual labour. By a parliamentary return (No. 24) made during the present session (1836), the number of power-looms in the United Kingdom is as follows:—England, 95,975; Wales, 1939; Scotland, 17,721; Ireland, 1516; total, 117,151. In April, 1790, Dr. Cartwright took out a patent for combing wool: altogether he obtained ten different patents for inventions and improvements of various kinds. In 1807, a number of the principal cotton-spinners memorialised the government on behalf of Dr. Cartwright, who had hitherto reaped little advantage from the exercise of his inventive talents. He also petitioned the legislature himself in support of his claims; and in 1809 parliament granted him 10,000*l.* for 'the good he had rendered the public by his invention of weaving.' This was a smaller sum than he had expended on his projects, but it enabled him to pass the remainder of his days in ease and comfort. He died October 30, 1823, in the 81st year of his age.

CARTWRIGHT, JOHN, brother of the preceding, was born in 1740, at Marnham, and entered the navy at an early age. Soon after his thirtieth year, he published 'Letters on American Independence;' and though attached to his profession, he declined taking part in the struggle which ensued between the mother country and the North American colonies. In 1775, he received a major's commission in the Nottinghamshire militia, an appointment which the ministry regarded with displeasure. The attainment of annual parliaments and universal suffrage became the object of his exertions; and to further this end he was active in establishing the Society for Constitutional Information, and, in co-operating with Tooke, Hardy, Thelwall, and other advocates of reform. He was a witness on the trial of the above individuals; and in 1819, was himself the object of an *ex officio* prosecution, for having with others taken steps for procuring a 'legislatorial attorney' to be returned to parliament for the then unrepresented town of Birmingham. His name is intimately connected with the early history of the question of parliamentary reform. Lord Byron, when presenting a petition from him in 1813, said:—'He is a man whose long life has been spent in one unceasing struggle for the liberty of the subject.' He possessed considerable intelligence and ingenuity, and was the author of several useful projects, and a number of pamphlets and occasional addresses. Fox once passed a high eulogium on his public and private character. Though retaining his commission in the navy, he was invariably called Major Cartwright. He died 23rd September, 1824, and would have completed his eighty fourth year on the 28th. A bronze statue has been erected to his memory in Burton Crescent, London, by contributions from his admirers and friends.

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* These tapestries were recovered and brought to England, and exhibited lately in London, but as no purchaser was found, they were bought by a foreigner, who took them to the continent.

(*Life and Correspondence of Major Cartwright*, edited by his niece, F. D. Cartwright, 2 vols., 8vo., London, 1826.)

CARUN'CULA, a name applied by botanists to protuberances found occasionally surrounding the hilum of a seed. It is sometimes also called a strophiloa. Parts of this kind occur on the seeds of Euphorbia Lathyris.

CA'RUS, MARCUS AURELIUS, prefect of the prætorium under the Emperor Probus, succeeded him by the nomination of the soldiers, after they had murdered Probus, A.D. 282, in his camp near Sirmium in the Illyricum. Carus was a native of Narbo, an old Roman colony, and as such he prided himself in being a Roman citizen by birth. (See his letter to the senate announcing his nomination, in Vopiscus, *Historia Augusta.*) He made war against the Sarmatians, and defeated them. He marched next against the Persians, A.D. 283, and took with him his younger son Numerianus, leaving his elder son Carinus to rule over Italy, and the other provinces of the west, in his absence. Carus overran Mesopotamia, and conquered Seleucia and Ctesiphon, after which, as he was encamped beyond the Tigris, a great thunder-storm arose, and it was reported that the Emperor was killed in his tent by the lightning: the servants upon this set fire to his tent, and his body was consumed. His secretary, Calpurnius, however, in a letter which he wrote to the Prefect of Rome, said that the Emperor, who was already ill, died during the storm. But the strongest suspicions rested upon Arrius Aper, Prefect of the Prætorium, the same who soon after killed Numerianus. Carus reigned about seventeen months. He was succeeded by his two sons Carinus and Numerianus.

Coin of Carus.

[Brit. Museum. Actual Size. Gold. 75 grains.]

CARVING, the art of forming any hard materials into a proposed shape or figure by means of sharp instruments. It is usually understood to refer exclusively to works in ivory or wood, to distinguish it from carving in marble or stone, which comes under the term *sculpture*: or in metals, when it is called *chasing*.

The antients used ivory to a great extent in works of art, and its union with gold, called by the Greeks *chryselephantine* sculpture, was adopted by the greatest artists. The colossal statue of the Olympian Jupiter at Elis, by Phidias, was one of the most celebrated examples of this combination. In later times carving in ivory has been confined to smaller objects, as figures, reliefs, enrichments of flowers, fruit, and other devices on vases and cups, and such objects of general use. The instruments used for carving in ivory are very similar to those employed in working in marble, consisting of chisels of different sizes, saws, rasps, and files; the polishing is effected, as in marble, by friction.

Wood of almost every description was a favourite material for carving among the antients: and, after clay, was doubtless, from the facility of cutting it, the first substance used for imitative art. Some figures of very remote antiquity found in the tombs in Egypt are of sycamore. In Greece many of the statues of the gods were of wood; and all those attributed to the first Dædalus were of that material, from which circumstance indeed wooden figures were called Δαίδαλα, or Dædalian. Wood seems to have been used for sculpture long after more valuable and durable materials were employed. Pliny and Pausanias describe many of these works, and mention the varieties of wood of which they were made. Among them were the oak, ebony, fir, cedar, box, citron, cypress, beech, fig, myrtle, olive, palm, poplar, vine, &c., &c.

For a long period in modern times there was a great demand for fine wood-carvings. The elaborately worked Gothic screens, choir-seats, and desks, in most of our cathedrals and colleges, canopies, frames for doors and pictures, cabinets, and indeed every description of furniture, are evidence of the extent to which it was employed, and of the skill of the artists. It must be admitted that many of these performances display more ability in the workmanship than good taste in the design, being, where figures are introduced, chiefly of grotesque and not unfrequently indelicate subjects. There are, however, specimens of chaste design, as well as careful execution.

One of the most eminent modern carvers in wood was Grinling Gibbon, a native of England. He was much employed by Charles II., particularly at Windsor Castle and Hampton Court. In London the choir of St. Paul's may be instanced as a work of this artist. Many of his best performances are at the country residences of some of the English nobility; the specimens at Chatsworth, the seat of the Duke of Devonshire, are admirable imitations of nature. They consist generally of dead game, sporting tackle, fruit, flowers, &c., &c. Gibbon died in 1721.

The German and Flemish carvers in ivory and wood were also very distinguished.

The woods preferred by modern carvers are the pear, lime, American pine, maple, oak, and box: and the tools they employ are round hollow chisels called gouges: others with an angular extremity called from the shape V tools; flat chisels of various sizes, and files. A mallet is sometimes used, but pressure, or a sharp blow from the bottom or heel of the hand is generally preferred. The surface is cleaned and polished with sand-papers of different qualities, by pumice-stone, and by friction.

In preparing wooden blocks for printing from, the object is engraved with instruments similar to those commonly used for engraving. This branch of the art does not therefore properly come under the term 'carving.'

CARY. [FALKLAND, LORD.]

CA'RYA, the botanical name of the genus of North American trees which comprehends the various kinds of hickory. It was formerly combined with Juglans, or the true walnut; but it is distinguished by the shell of its nuts not being deeply furrowed, and by the catkins of the male flowers growing in threes. This must not be confounded with careya, a genus of Indian myrtaceæ.

Several species of hickory are recognized by botanists; but, according to Michaux, the timber of them all is so similar in quality that it is impossible to distinguish it. The bark of the hickory is in all cases remarkable for the lozenge-shaped arrangement of its woody tissue; the wood is coarse-grained, very heavy, exceedingly tough and strong, and red at the heart; but on the other hand it decays quickly when exposed to the weather, and it is subject to be attacked by worms. It is on these accounts chiefly employed for the shafts and springs of carriages, for large screws, such as those of bookbinders' presses, for bows, chair-backs, whip handles, wooden-cogged wheels, hoops for casks, and a variety of similar purposes. When burnt, hickory wood consumes slowly, gives out a great heat, and forms a heavy coal, which remains glowing for a long while: it is considered to be upon the whole the best of all woods for fuel: it has however the fault of crackling and scattering about its sparks.

The following are the principal kinds of hickory:—

1. *Carya olivæformis*, the Pecan or Pecana nut. (Juglans augustifolia, *Hort. Kew.*) This is a swamp species, with a slender stem, sometimes as much as 70 feet high. Its leaves are a foot to 18 inches long; their stalks are downy; the leaflets, which are 2 or 3 inches long, or as much as 5 inches on very strong shoots, are taper-pointed and firmly serrated.

Their nuts are oblong, very smooth, angular in only a slight degree, about an inch and a half long, and thinner shelled than the other sorts. The kernel is good to eat, and by far the best of the hickories; on this account the nuts are a small article of North American trade. The pecan nut is found in Upper Louisiana and New Orleans. It is common on the banks of rivers in Missouri, Illinois, and Arkansas. It does not occur, except in straggling specimens, more than 200 miles above the mouth of the Ohio.

2. *Carya sulcata*, thick-shell-bark hickory, Springfield or Gloucester nut (*Juglans laciniosa*, Michaux), very common in all the low grounds adjoining the Ohio and its tributaries, where, along with three-thorned gleditschias, black walnuts, Virginian bird-cherries, American elms, planes, and different species of Acer, it forms dense forests; it is seldom found west of the Alleghanies. Its trunk is as much as 80 feet high, on which it has a noble spreading head. Its bark, like that of some of the other hickories, strips off in ribands from one to three feet long, which separate at their extremities and curl backwards, finally adhering to the trunk only by their middle. The leaves vary in length from 8 to 20 inches: in form they are very like those of *C. alba*, but they usually have 6 or 8 leaflets instead of 4, which is the invariable number in that species. The nuts are oblong, sharp-pointed at each end, with four elevated angles, and a thick shell of a yellowish brown colour, not white as in *C alba*. They are brought to market in North America under some of the names mentioned above.

3. *Carya alba*, white-shell-bark, shag-bark, scaly-bark hickory (*Juglans squamosa*, Michaux). The shaggy appearance of the bark, adverted to in speaking of the last species, has caused the above names to be applied to this common species. It extends from South Carolina to the neighbourhood of Portland in the state of New Hampshire, where it is said to disappear. It is the most slender-stemmed of all the hickories, its trunk being sometimes 80 or 90 feet high and not more than two feet in diameter, and is described as a magnificent tree in its native forests. The young buds are woody and slightly orange-coloured. The leaves are often 20 inches long; they have only four leaflets and an odd one, which are smooth and bright green above, finely downy on the under side, and serrated at the edge. The nuts are whitish, nearly round, hardly pointed at each end, angular, compressed, thick-shelled, remarkably small in proportion to the size of the fruit with its fleshy rind upon it. The kernel is next in quality to that of the Pecan nut. They form a common article of market commerce.

4. *Carya tomentosa*, mocker-nut hickory; so called in consequence of the smallness of the kernel compared with the size of the nut. Its leaflets are from 7 to 9 in number, slightly round, very downy on the under side; they become bright yellow in the autumn. The leaf-buds are thick, short, whitish-grey, and very hard in the winter season. The nuts are sessile, roundish, and enclosed in a rind which only opens half way to let them drop out; they are light brown, angular, and very little pointed. The bark of this species does not scale off, but rends into deep fissures. It grows the slowest of all the hickories; and is found chiefly in forests from New England to Virginia, and in the Alleghanies Pursh says, in fertile soils; but Michaux adds, that it nevertheless is the only hickory which makes its appearance in those sterile tracts called pine-barrens, where however it is only a scrubby bush. In the most favourable situations it rarely grows more than 60 feet high, and is usually a gnarled inelegant tree. Nuttall mentions a variety of this species as occurring a few miles from Philadelphia, with 'fruit nearly twice the ordinary size, as large as an apple.'

5. *Carya microcarpa*.—Leaflets about five, oblong-lanceolate, sharply serrate, and obviously tapered to the point; smooth on each side, glandular beneath. Fruit roundish, with a small thin-shelled nut, which is somewhat quadran- ular, and abruptly rounded at the end, with a very small nt. According to Nuttall, this is found wild on the banks Schuylkill, in the vicinity of Philadelphia, where it large tree with an even bark. The fruit is much af *C. tomentosa*, and eatable, but very small, not size of a nutmeg.

ra, bitter nut, or swamp hickory; found mont in the north, as far as the most e American Union. In woods near measured several individuals which in circumference, and from 70 to 80 feet high; but in general it is smaller. It is the latest in leafing of all the hickories. The leaflets are 7 to 9 in number, smooth, coarsely and irregularly serrated, long, lanceolate, and more wrinkled than in other species. The fruit is small, roundish, with a thin rind; the nuts are obovate, depressed at the end, with a central projecting point; they have no angles, and are broader than they are long; the shell is thin and brittle, and the kernel so bitter and austere that even squirrels refuse to eat it. This species is easily known in winter by its yellow buds.

7. *Carya aquatica*, found only in the lower parts of the southern states of the American Union, in swamps, and by the side of ditches surrounding rice-fields, along with red maples, deciduous cypresses, and Carolina poplars. It is readily known by its very narrow taper-pointed leaflets, which vary in number from 9 to 11. Its fruit is small, ovate, tuberculated, angular, and placed upon stalks in little clusters. The nuts are bright brown, ovate, angular, but little pointed at either end; they are very thin-shelled, and contain an extremely little kernel. The tree grows from 40 to 50 feet high, and is of much less value than the other species.

8. *Carya porcina*, the pig-nut hickory, or hog-nut. This is most common in the middle states, beginning with Lancaster county, Pennsylvania, in the north. It is one of the largest trees in the United States, growing to the height of 70 or 80 feet, with a diameter of 3 or 4 feet. Its brown shoots and oval very small buds distinguish it in winter. The leaflets are lanceolate, very taper-pointed, regularly serrated, and from 3 to 7 in number; they are quite smooth on each side, and on vigorous shoots in shady places their stalks are violet. The fruit is sessile, and varies in form from pyriform to spherical: its little nuts correspond in this respect with their rind; they are scarcely at all angular, and always rounded at the apex, with a sharp point: their shell is very thick and hard, their kernel sweet but small, and difficult to extract.

9. *Carya myristicæformis*, nutmeg hickory. This is a little brown species, of which Michaux obtained a single branch with about 30 nuts, at Charlestown, from a negro gardener, who procured them in the neighbourhood of that city. Its leaves are like those of *C. aquatica*, but not quite so long and narrow. The fruit is sessile, oval, tuberculated, and contains a small, smooth, brown, striated nut, with an exceedingly thick shell, and a very small kernel. Elliott, who resided near Charlestown, and wrote on the plants of Carolina, could never gain any further intelligence of this plant.

(See Michaux's *Arbres Forestiers de l'Amérique Septentrionale* for further details regarding these trees, most of which are found growing in the plantations of Great Britain.)

CARYA'TIDES (Καρυάτιδες), female figures employed in architecture in place of columns, like Atlantes and Telamones. Vitruvius attributes the origin of Caryatid figures to the circumstance of the inhabitants of Carya, a city of Peloponnesus, taking part with the Persians during the invasion of Xerxes, and their consequent punishment the men were slain, and the women carried into captivity, and their ignominy was perpetuated by the employment of figures, similar to the women of Caryæ, in place of columns. This absurd story however is hardly worth relating. It has sometimes been conjectured that these figures represent the virgins who celebrated the worship of Diana; but the better opinion probably is, that they represent Athenian virgins carrying on their heads the sacred vessels used in religious ceremonies. The use of Caryatid figures appears to be more antient than the date of the story told by Vitruvius; like many other forms of art, they were most probably drawn from Egypt.

Six beautiful Caryatid figures were employed in the Pandrosion, one of the buildings on the acropolis of Athens. The northern portico of the Pandrosion had six Ionic columns, four in front, and one on each flank: the southern portico was supported by six Caryatid figures, four in front, and one on each flank. They were placed upon a basement, and supported an enriched entablature. (Stuart's *Athens*, vol. ii., Plates.) One of the figures is now in the British Museum among the Elgin collection. The execution of this figure is very fine: its height is seven feet nine inches.

At the sides of the New Pancras Church, London, and at the east end, are two projecting wings with four Caryatid figures in each. The whole is an imitation of the Pan-

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of a
some of
believed the
represent the
Mary Magdalen—
the Innocents—The

* These tapestries were
lately in London, but
foreigner, who took them to

drosion; but the figures are very ill executed. These excrescences form the entrance to the places of sepulture under the church.

[A Caryatid figure from the Pandrosion, now in the Brit. Museum.]

CARYBDEA. [MEDUSA.]

CARYCHIUM. [PLEROCHEILUS.]

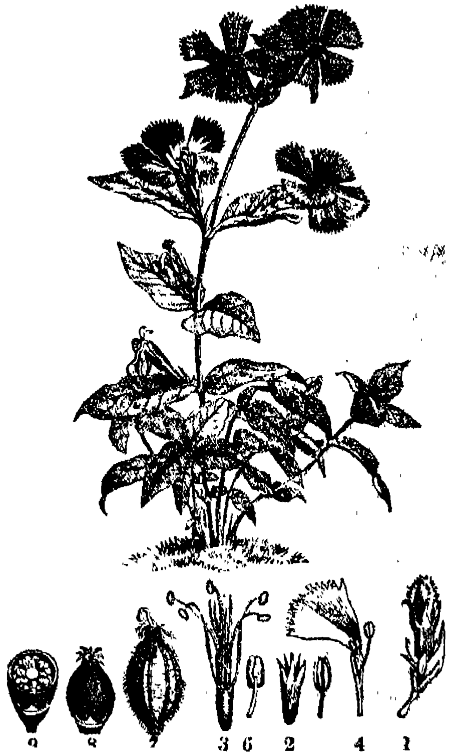
CARYOCATACTES. [CORVIDÆ.]

CARYO'CAR, the only genus of the natural order *Rhizobolaceæ*, one of whose species yields the butter-nuts of the London fruiterers' shops. One species is described by Aublet under the name of *Pekea butyrosa*, as a large tree with a trunk eighty feet high, and three feet in diameter. The bark is greyish; the wood reddish, hard, and compact. The leaves are opposite, each composed of five leaflets arranged in a palmated manner, the central leaflet being the largest, the two lower the smallest: they are as it were articulated with the end of a footstalk seven or eight inches long, hollowed at its summit, but cylindrical otherwise, and a little enlarged at its base; the leaflets are smooth, oval, and pointed, the largest seven inches long by three broad. The flower-buds are inclosed in two great opposite bracts. The flowers grow in large bunches at the extremity of the branches and the twigs; their footstalks are downy. The calyx is fleshy, deeply divided into five leathery concave rounded parts. The corolla has five large white petals. The stamens are very numerous. The berries are covered by a rind two or three lines thick, and consisting internally of a buttery yellowish subtance, which melts between the fingers, and which is sometimes used in cooking instead of animal butter. Under the rind lies a stone covered all over with slender stings, which easily separate, and become very troublesome to those who open the stones; within is a kidney shaped kernel, covered with a brownish membrane, and very good to eat; it is commonly served at table. It is called pekea by the blacks in the neighbourhood of Oyapoco in French Guiana, where it is much cultivated. The species that furnishes the butter-nuts of the London markets is much like this, but is called Tata-youba by the natives of Guiana, and differs in having no stings upon the surface of the stone of its fruit: this is the *Pekea tuberculosa* of Aublet; the *Caryocar tomentosum* of modern botanists.

Another species, the *Caryocar nuciferum*, bears what are called the Suwarrow or more properly Saouari nuts of commerce. It has only three leaflets to each leaf, each with a toothed margin, and a taper-pointed extremity; the flowers are very large, deep brown externally, and rich crimson in the inside; the fruit is in form like an egg, covered with a thick rough brown rind, beneath which is a soft greenish buttery substance. The nut has a stinging surface, and contains a very excellent kernel, from which may be extracted an oil like that from sweet almonds. All these plants are figured in Aublet's *Plantes de la Guiane Française*. The last is represented in the *Botanical Magazine*, vol. liv.; but there appears to be some confusion in the account there given of the plant.

CARYOCRINITES. [CRINOÏDEA.]

CARYOPHY'LLEÆ, a natural order of plants, the type of which may be considered the *Dianthus caryophyllus*, or common garden pink. It consists of plants having narrow, opposite, undivided leaves, arising from tumours at the articulations of the stem; flowers with a definite number of hypogynous stamens; a fruit with a central placenta, and seeds that usually have the embryo rolled round mealy albumen. The species are in many cases mere weeds, in no instances have they properties of any importance, being mostly inert; but are occasionally objects of cultivation on account of their pretty flowers, as is the case in the whole genus *Dianthus*, and in several species of *Silene*, *Agrostemma*, *Lychnis* and *Saponaria*. The order has always been divided into two parts, one of which has the sepals combined into a tube, and the other the sepals wholly distinct: these are now considered distinct natural orders, the former constituting *Silenaceæ*; the latter *Alsinaceæ*. Of these the last-mentioned is very near *Illecebraceæ*, and formerly contained species that are now known to belong to that order.



[Lychnis grandiflora.]

1, unexpanded flower; 2, calyx; 3, pistil and stamens; 4, a petal, with stamen attached; 5, anther impregnated; 6, a back view of the same; 7, fruit, with calyx remaining after impregnation; 8, the same without the calyx, and as it opens when mature; 9, the same cut horizontally.

CARYOPHYLLIA (zoology), a genus of corals of the section Madrephylliæa of De Blainville. [MADREPHYLLIÆA.]

CARYOPHYLLUS AROMA'TICUS, the clove-tree (in botany), is an evergreen small tree, belonging to the natural order *Myrtaceæ*, with opposite, ovate-lanceolate, shining, leathery, stalked leaves, and a short terminal cluster of flowers. The flower-stalks are green; the calyx consists of a brownish-red cylindrical tube, terminated by four ovate teeth; there are four small greenish concave petals, and a large cluster of yellow stamens. The fruit is an oblong one-seeded purple berry, crowned by the persistent teeth of the calyx. All the parts are, as in other true myrtaceous plants, covered with dots containing the essential oil peculiar to the species. The clove is a native of the Moluccas, whence it has been carried to all the other tropical parts of the world. Captain Owen's people found it apparently wild even upon Fernando Po, whither it had been probably transported by the Portuguese. The cloves of the spice shops are the flower-buds of this plant, gathered before they open, and dried in the sun; the round ball at their ends is the corolla inclosing the stamens; the quadrangular part below is the tube of the calyx; and the four teeth are the divisions of the calyx. The name *clove* is a corruption of the French word *clou*, a nail, a name that has been suggested by the resemblance of the dried clove to such a thing. The aromatic stimulating effects of cloves are well known. For a good account of their introduction to Europe, consumption, &c., see 'Botanical Magazine,' vol. liv., t. 2750. By some modern botanists, the genus *Caryophyllus* is reduced to *Eugenia*.

[Caryophyllus aromaticus.]

The Caryophyllus Aromaticus grows naturally in New Guinea and the Molucca islands, from which last exclusively Europe was supplied for a long time. About 1769 the French introduced it into the Isle of France, of Bourbon, and the Sechelles, and in 1771 into Guiana. In 1798 the cultivation of this tree was extended to Sumatra, and very lately it has been introduced into Brazil. A tree twelve years old will yield from 5 to 20 pounds of cloves annually; when older it may yield about 60 pounds, after which the quantity again diminishes. But as a single stem may live 150 years, it may furnish during that time 1100 pounds of cloves. Each clove is about half an inch in length. The external colour is dark brown, appearing as if covered with dust or little warts, with a somewhat fatty coating. When broken across, the appearance is decidedly oily, and oil quickly exudes from the exposed broken surfaces. The odour is strong and peculiar, but agreeable: the taste aromatic and burning.

Several varieties of cloves are found in the market. The difference of colour is attributed to the different season of the year when the gathering was made. 1st. Soft cloves, called also the Dutch Company's cloves: these have generally been distilled once, and have but a faint odour and taste. 2nd. Dry cloves, which are mostly distinguished according to their place of growth. The English Company's cloves, which are the finest sort, are of a large size, and of a bright reddish-brown colour. The Amboyna are, probably the soft Dutch cloves. The Bourbon cloves are small: those of Guiana are still smaller: these two last named sorts are chiefly used to mix with the former and finer kinds. Analyzed by Trommsdorff, 1000 parts yielded of

Volatile oil	180 parts
Scarcely soluble extractive	40
Gum	130
Resin	60
Tannin	130
Lignine	280
Water	180

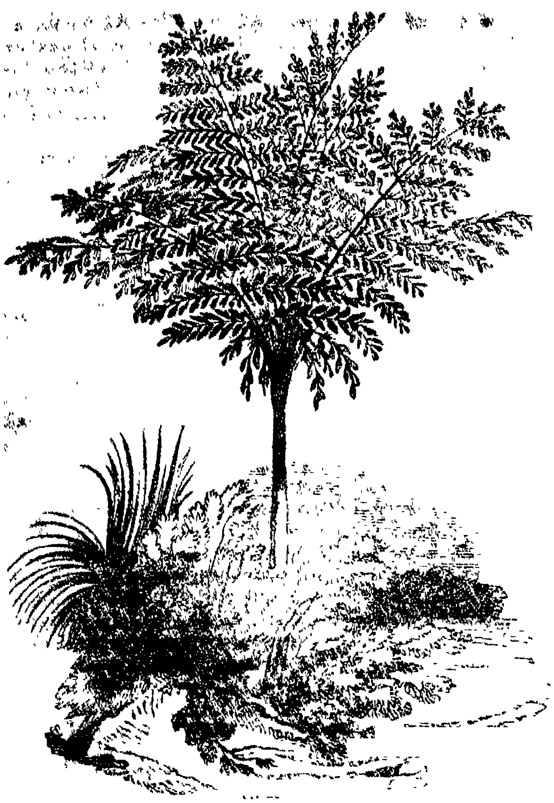
By distillation a thickish oil is obtained, which is at first colourless, but by time becomes yellow and brown. Its odour partakes strongly of that of cloves: its taste is very fiery and aromatic: it re-acts as an acid. In time there separates from it a stearopten or clove-camphor, called *caryophyllin*. This principle may be procured in greatest quantity from the English Company's cloves, more sparingly from the Bourbon and Cayenne cloves: in some it appears to be altogether wanting. Owing to the presence of so much oil, cloves cannot be powdered without adding some gum or sugar during the process.

Cloves are employed in medicine, and also more extensively for culinary purposes. When received into the stomach they are powerfully stimulant, and promote digestion when taken along with food which is insipid or difficult of digestion. Though the action is generally limited to the stomach, yet if taken in excess, or the use very long continued, it extends to the brain, causing giddiness and other inconveniences. Cloves may be given in powder, along with gum, in very moderate doses; but the infusion is a preferable form. Either alone, or when made the vehicle for carbonate of ammonia, nothing so effectually and safely removes that feeling of coldness and weight about the stomach experienced by hysterical or gouty persons, and renders it unnecessary to have recourse to alcoholic stimulants, such as brandy, which is too frequently employed under such circumstances. Oil of cloves is used to drop into decayed teeth, and also is given along with many purgative and other medicines to correct their griping tendencies.

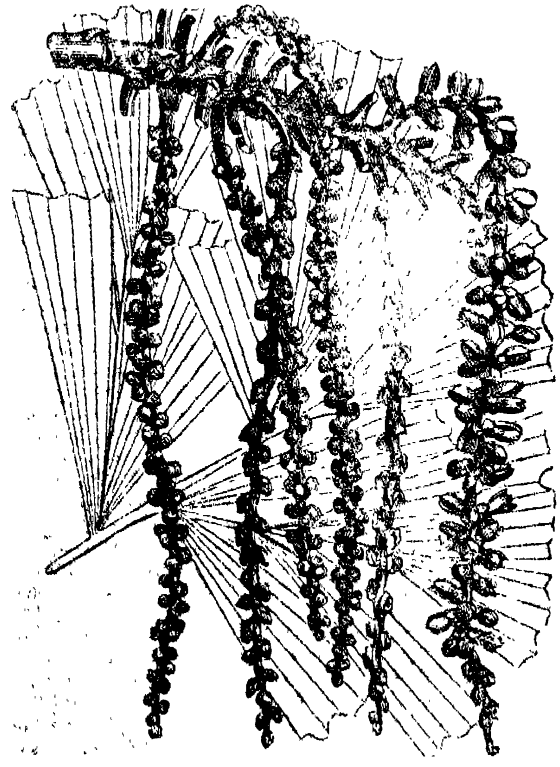
The fruit of the clove, called the mother clove, possesses little odour or acrimony; but when preserved with sugar it forms a good condiment to be eaten at dessert by persons with weak digestion. What is called the royal clove is merely a monstrous variety of that above described.

The buds of the *Calyptranthes aromatica* are employed in Brazil as a substitute for those of the *Caryophyllus aromaticus*.

CARYO'TA, a genus of palms, with pinnated leaves and wedge-shaped leaflets, strongly toothed at the extremity. It has monœcious polyandrous flowers, a somewhat peltate stigma, and a one or two seeded pulpy fruit, with the embryo near the point of the albumen. The best known species, Caryota urens, is a native of most of the tropical parts of Asia, especially in mountainous situations, where, according to Roxburgh, it grows to be one of the largest of the palm tribe. Its trunk is described as being 60 feet high, thick in proportion, and slightly marked with annular scars, produced by the fall of its leaves; its wood is so hard as to be cut with some difficulty, and is consequently of considerable value, provided the soft sap-wood in the centre is scraped away. Its leaves are pinnate, the leaflets obliquely triangular, the apex of the triangle being the point where they are attached to the stalk; their end is irregularly toothed, as if bitten or gnawed by an animal (technically *præmorse*); and their general appearance is on this account so remarkable that Rumf compares them not inaptly to the fin of a fish. The mass of flowers (*spadix*) is said to be from 6 to 16 feet long, divided into many simple branches, which are pretty thickly covered with innumerable sessile flowers. The fruit is called a berry, one-celled, roundish, about the size of a plum, with a thin yellow rind, so acrid that it produces a severe sensation of burning if applied to the skin; and hence its name, *urens*. It is generally stated, apparently upon the authority of Rumf, that this noble species of palm yields no sap fit for manufacture into wine, and that the sago obtained from the soft central part of its stem is of such inferior quality as only to be employed in times of famine. Roxburgh however gives a very different account of it. He says, 'This tree is highly valuable to the



[Caryota urens.]



[Caryota urens. A portion of the spadix.]

natives of the countries where it grows in plenty; it yields them, during the hot season, an immense quantity of toddy, or palm wine. I have been informed that the best trees will yield at the rate of one hundred pints in the twenty-four hours. The pith, or farinaceous part, of the trunk of old trees is said to be equal to the best sago; the natives make it into bread, and boil it into thick gruel. I have reason to believe this substance to be highly nutritious; I have eaten the gruel, and think it fully as palatable as that obtained from the Malay countries.' This remarkable tree is not uncommon in hot-houses where palms are cultivated.

CASA'LE, a province and town of the continental Sardinian States. The province is bounded to the N. and E. by the Po, which divides it from the provinces of Vercelli and Mortara, on the S. it borders on the province of Alessandria, and on the W. on the provinces of Asti and Turin. The province of Casale formed part of the former Marquisate of Monferrato. It is intersected from N.W. to S.E. by a ridge of hills which divide the valley of the Tanaro from that of the Po, and are known by the name of the hills of Monferrato. The vine thrives on this tract, which produces some of the best wine in Piedmont. It is also known for its truffles. A great quantity of sheep are reared in the province. Silk is another of its chief products. The population of the province is 102,000, divided among 73 communes. (Serristori, *Saggio Statistico.*) The chief town, Casale, has 16,000 inhabitants, a considerable number of whom are Jews. It is situated on the right or S. bank of the Po, is fortified, and has an old castle which was once the residence of the marquises of Monferrato. The town has sustained several sieges. The cathedral has a chapel cased with costly marble; the church of Santa Caterina is rich in paintings, and that of the Dominicans is also worth seeing. Casale has several palaces belonging to the nobility, a theatre, and a royal college, besides a college for boarders kept by the fathers Somaschi. There are several manufactures for spinning silk, and a considerable trade is carried on in corn, wine, and other agricultural produce. Casale is a bishop's see and the residence of the intendente or governor of the province, and has a Tribunale di Prefettura, or court of justice, from which appeals lie to the senate or supreme court of Turin. The town of Moncalvo, with 3700 inhabitants, is next to Casale in importance, and was the birthplace of the painter Caccia, several of whose paintings are seen in the church and convent of St. Francis. The town of Casale is 35 miles E. of Turin and 18 N.N.W. of Alessandria.

CASALE is the name of several other towns in Italy, the names of which begin with the word casale, which is derived from casa 'a house,' and meant originally a collection of houses. Such are: Casalmaggiore in the province of Cremona in Lombardy, Casal Pusterlengo in the province of Lodi, Casalnuovo in Calabria, &c.

The villages, some of them very large, in the islands of Malta and Gozo, are also called Casali. [MALTA.]

CASAN, one of the five lieutenantcies or provinces, into which the former kingdom of Casan is now subdivided, forms a portion of Asiatic Russia, and adjoins the province of Nishni-Novgorod, in Western Russia in Europe. It lies between 54° and 57° N. lat. and 46° and 52° E. long. The surface is in general an undulating level, the south-eastern part of which is varied by the western branches of the Ural mountains, while a small range of limestone hills, called the Undarian Mountains, runs parallel with the right bank of the Volga, but nowhere attains a greater elevation than 1000 feet. Its area is estimated at about 23,600 square miles, and its population, which was about 840,000 at the close of the last century, has increased to about 1,028,000, of whom 474,000 are Russians, Poles, and Cossacks, 245,000 Tartars, 235,000 Tshuwashes, 56,000 Circassians, (Tsheremisses,) and 18,000 Mordwines and others. It is divided into 12 circles.

The principal river in Casan is the Volga, which enters it from N. Novgorod in the north-west, runs through the heart of the province, where it is increased by the large river Kama, and quits it in the south, on the borders of the province of Simbirsk. The Volga has considerable breadth before the Kama joins it, but is enlarged to 2400 feet by the accession of that stream. The Verluga, the larger and lesser Kokshaya, Sviaya, Tsyvil, and Kasanka contribute also to augment the Volga in this quarter. The province is full of small lakes, which as well as the rivers are well stocked with fish. In the Undarian mountains many sulphurous springs and much liquid naphtha are found.

The climate is on the whole salubrious; but the winter is so severe that the rivers are covered with ice from November to the end of March. The Volga, on the breaking up of the ice, rises above seven feet beyond its level in summer. The fruits of Western Europe ripen in the open air.

Agriculture is pursued to a limited extent; and a sufficient quantity of hemp, fruit, and vegetables is grown for ordinary consumption. Indeed, the soil is generally fertile, but hands are wanting for its proper cultivation. Whole districts are occupied by forests and swamps; the chief kinds of trees are the pine, fir, and oak; and the woods abound in bears, wolves, and feathered game. Large herds and flocks are reared on the rich pasture-grounds which border the rivers; and the fleeces of Casan are of good quality. The Tartar inhabitants make much wax and honey. The province contains stone for building, chalk and lime, alabaster, saltpetre, and small quantities of iron and copper.

The inhabitants are engaged generally in spinning and weaving, tanning, turning and making articles of wood, and oil-crushing, for which last purpose they employ hemp-seed as well as nuts, of which large quantities are obtained, particularly in the districts that lie between Casan and Simbirsk. The province contained, in 1808, 247 manufactories.

The Russian part of the population have preserved their mode of life; the Tartars live either in the towns, where they inhabit a particular slobode or quarter, or in the villages. The Circassians, Tshuwashes, &c. dwell either in the villages or occupy detached farms or settlements, and are by no means distinguished for their cleanly habits.

In 1810 the income of the province was 5,156,772 roubles, (about 236,360*l.*) and the expenditure 483,336 roubles, (about 22,150*l.*)

Casan was in earlier ages subject to Tartar sovereigns; it was conquered by Ivan II. and fell under the Russian sceptre in the year 1552.

CASAN, the capital of the province, is an antient Tartar town, which stands on a hill rising out of a low plain, between the Casanka and the Bulak which flows into it, and about five miles above the influx of the Casanka into the Volga. It is composed of the Kremlin or citadel, the middle town, and the lower town; the whole is encircled by gardens, fields, and meadows, which, when the Casanka is swollen by the waters of the Volga in the spring, are subject, as well as the lower town, to very heavy inundations. The Kremlin, which is on the banks of the Casanka, contains the governor's palace and archiepiscopal residence, barracks, prisons, and houses of correction, but particularly the highly venerated 'Karsianskaya Boyeniater,' or cathedral of the Holy Virgin of Casan, the prototype of other Greek churches in various parts of Russia. The middle town is chiefly distinguished by the Gostini-Dver or Bazaar, and the market-place which is surrounded in most parts by lofty houses, chiefly built of stone, and planted with rows of trees. Several of the churches are well built. The lower town, next to the Bulak, contains a number of rows of houses, separated by gardens, which are the residence of the merchants and dealers; and also the university buildings, a handsome pile embellished with Corinthian columns, and containing a library, a cabinet rich in Russian and Tartar coins, collections in Natural History and for experimental philosophy, a botanical garden, and a well-furnished observatory. Casan has 4 squares or open spaces, 33 streets, 41 Greek churches, 4 monasteries, and 8 Tartar medshets or places of worship; a Greek seminary for divinity students, 2 gymnasia and 4 other public schools, 9 Tartar schools, a military school for 350 boys, an orphan asylum and a Russian and a Tartar printing-house. From the lowness of its situation the town is unhealthy, and there is also a want of good water for drinking. The surrounding country produces all kinds of grain, potatoes, pease, and vegetables, in abundance, and the fisheries of the Volga furnish the place with an abundant supply of fish. In 1820, Cochrane stated the population to consist of 40,000, inclusive of 12,000 Tartars. Casan is the seat of several manufactures, particularly woollens, cottons, morocco and other leather; soap, steel, ironware, earthenware, tiles, gunpowder, spirits, and beer. It is the great mart for the products of the adjacent parts, and carries on an extensive trade, of which teas and Asiatic manufactures are leading articles. The Tartars live as a distinct community from the Russians, and have settled on the opposite bank of the Bulak, upon the eminences around Lake Kaban; their dwellings are small and rude. Casan came into the possession of the Russians in the year 1552, when the Czar John Vasilevitsh captured it after a siege of 43 days. The jurisdiction of the university extends over 16 circles. (Cochrane and Holman.)

CA'SAS, BARTHOLOME' DE LAS, was born at Seville of a noble family in 1474. When he was about 20 he accompanied his father, who embarked with Colombo in his second voyage to the West Indies. On his return to Spain he entered holy orders and became curate of a parish. After some years he went back to Hispaniola, where he found the Indian population cruelly oppressed by the Spaniards. By the system of 'repartimientos,' enacted by order of King Ferdinand of Aragon, and enforced by the governor Albuquerque, the unfortunate natives were distributed like cattle into lots of so many hundred heads each, and sold to the highest bidders, or given away to courtiers and other men of rank in Spain, who by their agents sold them to the colonists. The mortality became so great among these unhapppy beings, who were naturally of a weak constitution, that out of 60,000 Indians, who were on the island of Hispaniola in 1508, only 14,000 remained in 1516. The Dominican friars were the only persons who loudly disapproved of this system; the secular clergy and even the Franciscans took part with the colonists. Las Casas sided with the Dominicans, and finding that Albuquerque was deaf to all their remonstrances, he sailed for Spain, asked and obtained an audience of Ferdinand, to whom he made such a dreadful picture of the fatal effects of the repartimientos, that the king's conscience became alarmed and he promised Las Casas that he would remedy the abuse. But Ferdinand died soon after, and Charles I., commonly called Charles V., succeeded him. The minister Ximenes, who governed Spain in the absence of the young king, listened with favour to Las Casas' remonstrances, and appointed three superintendents from among the Hieronymites, an order which enjoyed great consideration in Spain, with instructions to proceed to the West Indies, and examine the matter on the spot, and with full authority to decide finally upon the great question of the freedom or slavery of the Indians. He sent with them a jurist of the name of Zuazo, who had a great reputation for learning and probity, and, lastly, he added Las Casas to the commission with the title of 'Protector of the Indians.' The commission proceeded to Hispaniola in 1517. After listening to the statements of both parties, colonists and Dominicans, or friends of the Indians, and having also examined the physical and intellectual condition of the natives themselves, the Hieronymites came to the conclusion that the Indians would not work unless obliged to do so; that their mental capacities were much lower than those of Europeans, and could not be stimulated to exertion or be made to follow any moral or religious rules, except by authority; and therefore they decided that the system of repartimientos must continue for the present at least, but at the same time they enforced strict regulations as to the manner in which the Indians should be treated by their masters, in order to prevent as much as possible any abuse of power on the part of the latter. Las Casas, not satisfied with this decision, set off again for Spain to appeal to Charles V. himself, who came about that time from Flanders to visit his Spanish dominions. The question was discussed in the king's council, and as the difficulty of cultivating the colonies without the repartimientos was the great objection, Las Casas, it is said, observed that the African blacks, who were already imported into the West Indies, were a much stronger race than the Indians, and might make a good substitute. This suggestion has been made, by most writers on American affairs, a ground of reproach against the memory of Las Casas. It ought to be observed however that the fact of the suggestion rests solely upon the authority of Herrera, who wrote 30 years after the death of Las Casas. The writers contemporary with Las Casas, and Sepulveda himself, his determined antagonist, are silent upon this point. (Grégoire, *Apologie de B. de Las Casas*, in the iv. vol of the 'Memoirs of Moral and Political Science of the French Institute.') It is certain, and both Herrera and after him Robertson, acknowledge it, that, as early as 1503, negro slaves had been imported into America, and that, in 1511, a large importation took place by king Ferdinand's authorization. The Portuguese seem to have been the first Europeans who traded in black slaves. A negro was found to do as much work as four Indians. Charles V. granted a licence to one of his Flemish courtiers to import 4000 blacks into the West Indies. The courtier sold his licence to some Genoese speculators for 25,000 ducats, and the Genoese then began to organize a regular slave-trade between Africa and the New World. But the price of the blacks was so high that few of the colonists could avail themselves of this supply, and consequently the slavery of the Indians was perpetuated for a long time after, until the extinct on most of the islands.

Sto. cording to

Las Casas, unable to obtain the deliverance [illegible] Indians through his oral remonstrances, resorted [illegible] pen. He wrote: 1st. 'Tratado sobre la materia de los Indios que se han hecho esclavos por los Castellanos;' 2nd. 'Brevissima relacion de la destruycion de las Indias Occidentales por los Castellanos,' in which he gives a frightful account of the acts of oppression and barbarity committed by the conquerors; 3rd. 'Remedios por la reformacion de las Indias;' 4th. 'Treinta proposiciones pertenecientes al derecho que la Yglesia y los principes Cristianos tienen sobre los Infieles, y el titulo que los Reyes de Castilla tienen a las Indias Occidentales.' In this last treatise he sets down as a principle that the sovereignty exercised by Christian kings over the discovered countries rested solely upon the grant made to them by the pope, which was for the specified object of promoting and establishing Christianity among the natives; that this sovereignty was to be therefore a limited and protecting supremacy of a spiritual and evangelical nature, leaving the natives in possession of their individual liberties and property. (Navarrete, *Coleccion de los Viages y Descubrimientos que hicieron por mar los Españoles*, &c., 2 vols. 4to., Madrid, 1825, in which the author treats at length of Las Casas.)

Las Casas, despairing of effecting any good for the Indians in the Spanish settlements, formed the project of a new colony to be established on the recently discovered tierra firma, or main land, and to be managed according to his own views, which were afterwards realized in a great measure by the Jesuits in their settlements of Paraguay. Accordingly he obtained from Charles V. a grant of 300 miles along the coast of Cumana. But before he set out he had to sustain a public disputation, in the presence of the king and council, against Quevedo, bishop of Darien, who had lately returned from the West Indies, and whose opinions concerning the Indians were diametrically opposed to those of Las Casas. As usual in such cases, the controversy did not clear up the matter, and Charles, uncertain what to do, confirmed his grant to Las Casas for the sake of experiment. But before Las Casas could reach his destination, an expedition had sailed from Puerto Rico under Diego Ocampo, for the purpose of invading and plundering that very coast of Cumana which was intended by Las Casas for his pacific settlement. The consequence was that the remaining natives conceived such a horror against the Spaniards, that when Las Casas came to settle on the coast, they attacked his settlement, and killed or drove away the settlers. Las Casas, crossed in all his benevolent endeavours, and attacked by the sneers and reproaches of the colonists, went back to Hispaniola where he took refuge in the convent of the Dominicans whose order he entered in 1522. Some years after, he returned to Spain, and made a fresh appeal to Charles V. in favour of the oppressed Indians. He then met an antagonist in Doctor Gines de Sepulveda, who had written a book in defence of the slavery and destruction of the Indians, taking for his argument the treatment of the Canaanites by the Hebrews. Las Casas replied to him, and an account of the whole controversy is contained in the work which was published in 1552, styled 'Disputa entre el Obispo Fray Bartholomé de Las Casas y al Doctor Gines de Sepulveda sobre la justicia de las conquistas de las Indias.' Las Casas had meantime been appointed bishop of Chiapa, in the newly conquered empire of Mexico. After remaining for many years in his diocese, ever intent on mitigating the sufferings which the natives endured from the conquerors, Las Casas returned to Spain in 1551, having resigned his bishopric, and died in a convent of his order at Madrid in 1566. He bore among both natives and Spaniards, in the New World, the names of Father and Protector of the Indians.

He left in MS. 'Historia General de las Indias,' in 3 parts or volumes, in which he treats of the discovery, conquest, and subsequent occurrences in the New World, as far as the year 1520. This work has never been published. The two first volumes, in his own hand-writing, are preserved in the library of the royal Academy of History, and the third in the royal library at Madrid. 'In this work,' says Navarrete, 'Las Casas has displayed a vast erudition, mixed however with a disregard for temperance and discrimination. [illegible] access to many original documents, which he has [illegible]y copied or extracted, and for this he is entitled to the [illegible] confidence. He was also present at several of the [illegible]ly expeditions and conquests, and for them his authority has been followed by Herrera and others. He does not, however, deserve the same credit when he speaks [illegible] hearsay, as he confesses that he wrote both what he had seen, and what he had not seen but heard, during sixty years of his life, which he passed chiefly in the New World, and it is no wonder that his memory should fail him at times, so as to confound events and dates.'

CASAUBON, ISAAC, one of the most learned men of his age, was born at Geneva, on the 8th of February, 1559. His father and mother, Arnold Casaubon and Jeanne Rosseau, were natives of the Dauphiné, and retired to Geneva to avoid a religious persecution. They returned, however, after the persecution ceased, to Crest, a small town of Dauphiné, of which Arnold was appointed minister, and here young Casaubon studied under his father till his nineteenth year, when he went to Switzerland to hear the lectures of Francis Portus, a Cretan, who was then Professor of Greek at Lausanne, and whom he succeeded on his death in [illegible]. In 1586 he married Florence, daughter of Henry Stephens, the celebrated scholar and printer. About 1591 he was involved in serious pecuniary difficulties from having been surety in a large sum of money for an Englishman named Wotton (probably the well-known Sir Henry, who afterwards brought Casaubon to England), and though Joseph Scaliger and some other friends assisted him, he was much straitened in his circumstances by this loss, and either this or the moroseness of his father-in-law induced him to accept an offer of the Greek professorship at Montpellier. He removed to Montpellier in the latter end of 1596, and commenced his duties in the February of the following year. In 1599 Henry IV. sent for him to Paris, and in the following year appointed him one of the Protestant judges in the controversy between Du Perron, Bishop of Evreux, and Du Plessis-Mornay. In 1603 he succeeded Gosselin as head librarian to the king. The Catholics made many attempts to gain so distinguished a convert, but there does not seem to be any reason for concluding that they had even partial success, although it was given out that he had wavered in a conference with Du Perron. The death of Henry IV., in 1610, rendered his st[illegible] France neither safe nor profitable, and having [illegible] permission from the Queen of France, he gladly went over to England with Sir H. Wotton, the English ambassador. James I. received him with great distinction, and employed him in writing a confutation of Baronius. Casaubon was appointed Prebendary of Canterbury and Westminster, and had also a pension of 300*l.* He died on the 1st of July, 1614, and was interred in Westminster Abbey, where a monument was erected to his memory. His chief works are the following:—1. 'Strabo,' with Commentaries. Geneva, 1587; reprinted with Additions, Paris, 1620, fol. 2. 'Aristotelis Opera,' with Marginal Notes. Geneva, 1605, fol. 3. 'Theophrasti Characteres.' Lugd. 1592, 12mo.; the best edition is the third, printed at Lyon in 1612. 4. 'Suetonii Opera,' with an excellent Commentary. Geneva, 1596, 4to.; best edition Lutet., 1610, fol. 5. 'Athenæus.' Lugd., 1600, fol.; Lugd., 1612, fol. 6. 'Persii Satyræ.' Lutet., 1605, 8vo. 7. 'De Satyricâ Græcorum Poesi.' Lutet., 1605, 8vo. 8. 'Polybii Opera.' Lutet., 1609, fol. The dedication to Henry IV. is much admired. 9. 'Exercitationes contra Baronium.' London, 1614, fol. He left a large family.

CASAUBON, MERIC, son of Isaac, was born at Geneva on the 14th August, 1599. He was educated first at Sedan, then under a private tutor in England, whither he came along with his father, and in 1614 or 1616 he was sent to Christ Church College, Oxford, and elected student of that foundation. He took his degree of M.A. on the 14th June, 1621, and in the same year published a defence of his father and the Protestant faith against the Catholics, entitled 'Pietas contra Maledicos Patrii Nominis et Religionis Hostes;' and three years afterwards he published another vindication of his father in Latin, written by the command of King James. Bishop Andrews presented him to the living of Bledon, in Somersetshire, in 1624. In 1628 Archbishop Laud made him Prebendary of Canterbury and Rector of Ickham; and in 1636 he was created D.D. by the University of Oxford at the command of Charles I., who was then residing at that university. The civil war [illegible]ved h[illegible] of all his preferments, and he lived in retire[illegible]t till [illegible]e Restoration, notwithstanding many advantageous offers from Cromwell, who endeavoured in [illegible] to induce Casaubon to write a history of the war, which he declined doing; and from Queen Christina of Sweden, who offered him the [illegible]nt of one, or the superintendence of all the universities in her kingdom. At the Restoration he was restored to all his ecclesiastical preferments, and continued to employ himself in writing till his death, 14th July, 1671. He was buried in Canterbury Cathedral. He had several children by his wife, whom he married in 1651, and who brought him a good fortune. His son John was a surgeon at Canterbury. His works, though numerous, are not of great value. In his book on 'Credulity and Incredulity,' (London, 1668, 8vo.; second part, London, 1670, 8vo.,) he maintained the existence of witches and familiar spirits.

CASBIN, otherwise written Casvin or Kazvin, a city of Irak in Persia, which Kinneir, after the observations of M. Beauchamp, places in 36° 12′ N. lat., and 49° 33′ E. long. It was built about the middle of the fourth century by Shapoor Zoolactaf. Under the princes of the Suffide dynasty Casbin became the capital of the kingdom, and remained such until Shah Abbas removed the seat of government to Ispahan. Although now of diminished importance, it may still be considered a flourishing place, and maintains its rank in the first class of Persian cities. When Morier was there in 1809 a great part of the town was in ruins, occasioned by an earthquake—a calamity to which all the towns at the foot of the Elburz mountains are liable. But when the present writer visited the place in 1832, there was much appearance of recent building, and new buildings were still in progress, exhibiting a principle of revival which is not often exemplified in Persia. The town is situated in an extensive valley or plain upwards of twenty miles in breadth, called the Plain of Casbin. This plain affords good pasturage, contains an unusual proportion of villages, and is in parts well cultivated. The great want in this district is that of water; but an extensive system of irrigation by means of subterraneous aqueducts called *kanauts*, so common in this country, with the natural fertility of the soil, renders the vicinity of Casbin one of the most productive districts in Persia. The town is approached through a vast extent of vineyards and orchards inclosed by high walls. The grapes of Casbin are considered the best in Persia; and its pistachio nuts also are abundant and highly esteemed. The town itself is inclosed by a mud wall with towers, but without any ditch. In extent it is said to exceed Tehraun, the capital, but its population is less. The old traveller Herbert, who gives a good and sober account of Casbin in its best days, estimated the population at 200,000; but the vizier of the governor, who seemed well informed in the local statistics, told Morier in 1812, that the males then amounted to 25,000, without counting women and children. As the population would not seem to have decreased since then, we are strongly persuaded that this estimate is much too high; but we possess no materials for correcting the statement. Velvets, brocades, and a coarse cotton cloth, called *kerbas*, are manufactured at Casbin; and the place has also a considerable traffic with the province of Ghilan, on the Caspian. On account of the great proportion of new buildings, the town looks fresh and neat compared with many others in Persia. Some of the mosques and other buildings are good, but there are none that claim particular notice. Any grandeur or magnificence which Casbin may once have possessed has been destroyed by repeated earthquakes, which have left little remaining of the more antient structures but broken masses of domes, towers, and old walls. A ruined mosque, with a conspicuous dome, and the palace built by the Suffide princes, are the most remarkable remains. The palace, although surrounded with ruins, and for the most part abandoned, still serves as the residence of the prince-governor.

CASCARILLA, a name given by the Spanish Americans to all kinds of tonic barks, and especially in Peru to the different kinds of Cinchona; but in England this word is confined to one kind of bark, imported from the equinoctial parts of America, and used medicinally as a valuable aromatic and tonic. It arrives in Europe in short, thin, brittle folls, whence its name, *Cascara*, bark; *Cascarilla*, little bark. It is said to be received from Paraguay as well as the West India Islands: botanists have ascertained that it is furnished by certain species of the genus Croton, particularly by C. Cascarilla and Eleutheria. [CROTON.]

CASE (in Grammar). [ABLATIVE CASE.]

CASE, ACTION UPON THE, is one of the forms of action into which, by the common law of England, remedies for civil injuries are distributed. It derives its name from the circumstance that in the old form of the writ or process which formed the commencement of the suit, the particulars of the wrong complained of, or the case, were set out in detail with nearly the same precision as in a declaration. [PLEADING.]

CASE-SHOT are bullets contained in a cylindrical tin canister, or in a spherical shell of iron, which are discharged from a piece of ordnance. The first of these kinds of case burst immediately on leaving the gun, and the bullets, which at first take diverging rectilinear directions, soon lose all regularity of motion; and though they do great execution among the troops of an enemy within the limits of their effective range, that range, which does not exceed 500 yards, is in general of too small an extent. The divergency of the balls is said to be less when they are put into the case in tiers than when thrown in at random; and it is further lessened when the bottom of the case is formed of a strong plate of iron.

The spherical case-shot (the second kind above mentioned), which were formerly called Shrapnell's shells from the name of the inventor, are fired like common shells, and the length of the fuse being properly regulated, they only burst at the required spot; consequently the scattered balls and the fragments of the shell may be made to take full effect in a column of an enemy's troops at 800 or 1200 yards distance.

CASEIC ACID. [CHEESE.]

CASEMATE, a vault of stone or brick-work, generally built in the thickness of the rampart of a fortress for the reception of artillery which is to fire through embrasures pierced for the purpose in the front of the vault.

The smallness of the flanks in the antient bastions, and consequently the insufficiency of the fire from their parapets, gave rise to the invention of casemates which, being formed under those parapets, augmented the means of defending the ditches without rendering any change necessary in the size of the works. Casemates so situated exist in the flanks of the Tower bastions, in places fortified according to the second system of Vauban; and at New Brisach they are formed both in the flanks of the bastions and in those of the intermediate curtain.

Buildings of this nature appear to have been executed as early as the sixteenth century, for they are mentioned by the Italian engineers of that age; and, as it was foreseen that the smoke arising from the discharge of artillery in the vaults might, after a short time, render them untenable, Castriotto recommended that only cross-bows or engines for throwing stones should be used in them.

In the works of Vauban casemates have also been constructed under the parapets in the flanks of the ravelins and of their reduits, for the purpose of defending the ditch and of co-operating with the flanks of the bastions in opposing the construction of the besieger's counter-battery whose situation is indicated at H. [*Fig.* 1, BASTION.]

Besides the supposed inconvenience on account of the smoke, casemates in such situations, their front walls being unavoidably weakened by being pierced with embrasures, are liable to be destroyed in a short time by the direct fire from the counter-batteries, when the roofs, in falling, may bring down with them the parapet above. To avoid this evil, engineers have proposed that the casemates in the flank of a bastion should be covered by the tenaille [P *fig.* 1, BASTION]; in which case a fire of shells is to be directed over the tenaille when it is intended to oppose the enemy in the formation of his lodgments.

A difference of opinion has existed concerning the impediment which might be produced by the smoke in the service of the guns; and in the year 1800 an experiment was made by the French engineers in order to determine the question, in the casemates of the Tower bastions at New Brisach, by firing 60 rounds from two pieces in half an hour. Each of these casemates has a perforation in the front wall, above the embrasure, and an ordinary chimney in the wall opposite the front; and during the firing the door between the casemates was kept open. No considerable inconvenience was experienced by the officers who were present; and as the service of guns in casemates so situated can never be required for a longer time, it seems evident that the apprehensions entertained on this subject are without foundation.

Similar experiments have been made in the casemates Ricasoli at Malta, and the smoke went off very these, besides having an air-hole in the front are open towards the rear. The casemates proposed [illegible] to be built in the flanks of his tenailles are [illegible] in the same manner; and those exhibited in the system of Carnot are entirely open both in front and rear; the mortars or howitzers being masked by a wall over which the line of fire is to be directed.

The term casemate is also applied to the shell-proof vaults of stone or brick constructed in fortresses to protect the troops, provisions, and ammunition. These are usually formed on the fronts which are least exposed to the enemy, and within the masses of the ramparts either of the bastions or curtains in order that they may be sufficiently protected from the effect of shells falling on them; attention should also be paid in constructing them that their interiors be dry and well ventilated. For the latter purpose, they may have perforations in the front walls; and to render them water-proof, the upper surface of the vault is usually covered with cement. That surface is in the form of two inclined planes meeting in a ridge over the crown, and the ridge, as well as the gutter between every two casemates, is covered with lead. Drains are formed in these gutters to carry off the rain; to facilitate the descent of which into them, courses of dry bricks or beds of gravel are laid on the exterior of the vaults; over these is a covering of clay and earth terminating above in a level surface. (Colonel Pasley's *Elementary Fortification*, vol. ii. p. 367.) It was from the humidity as well as from the crowded state of the casemates at St. Philip's Fort in Minorca, and the consequent sickness among the troops, that the governor of that post was compelled to surrender it when it was besieged by the Spaniards in 1782.

When casemates are built for troops they should be 16 feet wide, in order to allow room for a double row of beds with a passage along the middle; and on the hances of the vault (the weakest part) the brick work should be about three feet thick. Those at Gibraltar are from 16 to 18 feet wide in the interior, and 16 feet high from the floor to the crown of the arch, which is semicircular, and they are from 40 to 100 feet long: some of them have air-holes in front, with chimneys through the roof, and the back walls have doors and windows which may be kept open while the firing is continued. The vaults of the casemates on the western heights at Dover are parabolical; the whole interior height is 17 feet, the breadth 18 feet, and the rise of the curve is nine feet from the springing courses.

CASHEL, an ecclesiastical province of Ireland, comprising the dioceses of Cashel, Emly, Limerick, Ardfert and Aghadoe, Waterford, Lismore, Cork, Ross, Cloyne, Killaloe and Kilfenora; a district very nearly co-extensive with the civil province of Munster. By the first Report of the Commissioners of Public Instruction (1834), it appears that the province contains 810 parishes, with a population of 2,335,373, of whom 111,818 are members of the Established Church; 2,220,310 are Roman Catholics; 966 are Presbyterians; and 2454 are Protestant dissenters of other denominations. The number of churches in the province is as follows: churches of the Establishment, 362; other places of worship in connection therewith, 80; Roman Catholics do. 634; Presbyterians do. 20; remains for other denominations of dissenters, 84; making a total of 1170 places of worship, or 1 to each 2000 of the inhabitants nearly. By the Second Report of the same Commissioners (1835), it appears that there are in this province 2332 schools, educating 151,890 young persons of both sexes, showing a proportion of 1 school to each 1000 of the inhabitants nearly, and of scholars a proportion of 6$\frac{47}{100}$ per cent. to the entire population; in which last ratio Cashel stands lowest of the Irish provinces. Of the above 810 parishes, which, in the Establishment, are divided into 469 benefices, there are 260 without glebes; 368 without any public place of Protestant worship; 200 in which no Protestant worship is performed; 81 in which there is no member of the established church; 88 in which such members do not exceed 20 in each; a total of 170 in which they do not exceed 50 in each; and in no parish of the province do they amount to 5000. (*Parliamentary Reports.*)

CASHEL, an archdiocese and city of Ireland. The diocese was erected into an archbishop's see at a synod held in Drogheda (March, 1152), where Donat O'Lonargan, the first of that name, was invested with the pall by Cardinal Paparo, the legate of Pope Eugene III. The see is valued in the king's books (28 Henry VIII.) at 65l. [illegible] Irish, or [illegible] sterling. The chapter consists of chantor, chancellor, treasurer, archdeacon, and five prebendaries; and the diocese, which contains 100 parishes, is divided into 48 benefices and 12 rural deaneries. With the exception of two parishes, the diocese is confined to the county of Tipperary, with which it is very nearly co-extensive. The proportion of Roman Catholics to Protestants of all denominations is as 36 to 1; of schools to entire population as 1 to each 753 nearly; and of scholars to entire population as 9$\frac{44}{100}$ to each 100, in which last ratio this diocese stands first in the province, and is very nearly on a par with the average of the province of Armagh. Of the four Irish archbishops, the Archbishop of Cashel ranks third.

The seat of the see is at Cashel, a very antient city, situated in the parish of St. Patrick's Rock and barony of Middlethird, in the country of Tipperary, 108 English miles S.W. from Dublin, a few miles E. of the river Suir, which flows southward towards Clonmel, from which town Cashel is distant fourteen miles. The boundaries of the old borough of Cashel included the entire of the antient walled town, and extended between two and three miles in a south-western direction on the road to Cahier and Clonmel, including an extent of 3912 statute acres. By the late Boundary Act, 2—3 Will. IV., c. 89, the limits of the borough have been enlarged so as to embrace a part of the city which had extended northward beyond the antient jurisdiction, by which the total area of the borough has been increased to 3974 statute acres, with a gross population of 6971 persons. Cashel sends one member to the imperial parliament.

The town, which is now much decayed, is chiefly built round the southern and eastern sides of an insulated mass of limestone, called the Rock of Cashel. On this rock, which rises abruptly in the midst of a rich plain, and commands an extensive view, formerly stood the residence of the petty kings of Munster. Sir James Ware, who lived so late as 1666, informs us that he has here seen the stone on which those potentates were inaugurated, and whom, it is said, they received the tribute of their subordinate toparchs. From the latter circumstance the name of the place has been derived; *cash-iol* being interpreted by some 'the stone of tribute;' but *cashiol* seems to be an original Celtic word, the same in all respects with the Latinized *castellum*, and the probability is that the place was so called from the castle or dun of the chieftain on its summit. A roll or schedule of the tribute payable here is still preserved; and the enumeration of the different articles of use and luxury which formed the rude substitute for rent is sufficiently curious—arms, clothing, provisions, live stock, and slaves, both male and female, being the dues ordinarily specified.

On the introduction of Christianity among the Irish, in the fifth century, Ængus, son of the king of Cashel, was one of Patrick's disciples. From him descended Cormac, son of Cullenan, who became king of Munster and bishop of Cashel about the beginning of the tenth century, and who is generally supposed to have built the very remarkable stone-roofed chapel still standing on the summit of the rock. To him also the building of the adjoining round tower has been ascribed; but neither supposition has been borne out by authentic evidence, and the greater probability is, that the chapel was built by Cormac Mac Carthy, king of Munster and bishop of Cashel, in the eleventh century, while of the round tower (pending the publication of the late prize essay of the Royal Irish Academy on that subject) nothing even probable is known. This much however is certain, that both edifices were built prior to the foundation of the cathedral, which was erected by Donald O'Brien, king of Limerick, immediately before the arrival of the English, towards the latter end of the twelfth century. The cathedral is in the form of a cross, the choir and southern transept embracing Cormac's chapel on two sides: the chapel however, not being built due east and west, stands a little out of line, flanking the southern side of the choir, to which it serves as a chapter-house, and which is interposed between it and the round tower on the northern side. The other buildings on the rock are a hall for the vicars-choral, built by Archbishop Rd. O'Hedian (1421), who also repaired the cathedral, the old episcopal palace at the west end of the cathedral, and the remains of the Abbey of the Rock of Cashel, founded by David Mac Carwell about 1269. A wall, intended for defence, some bastions of which were standing at the beginning of the present century, surrounds the platform on which the ruins stand, and completes the pile of building, which, from its commanding situation, massive proportions, and singular variety of outline, is justly considered the finest of the kind in Ireland. The chapel, which, from its undoubted antiquity, is an object of the highest architectural interest, consists of a nave and choir, the latter of lessened dimensions, and partaking rather of the character of a cell. There is a slender square tower, very similar to that of St. Peter's at Oxford, built in the re-entrant angle of the choir at the south side, and rising considerably above the roof, which is of stone, of a very lofty pitch, springing from corbels, and concentrically vaulted underneath. The upper vault is Gothic, being the only arch of that description in the entire building, and forms the ceiling of an apartment, the floor of which rests on the arch of the lower vault, which is Saxon, and in like manner forms the ceiling of the nave below. This under-arch springs partly from the thickness of the wall, and partly from the architraves of a double range of rudely-carved columns at either side: those of the lower range are square, adorned with a lozenge net-work, and form pedestals to the round columns of the upper tier, which are ornamented with bands and capitals. Outside, the corbels supporting the pedimented roof form the architraves to two similar tiers of pillars at either side, between the columns of the lower of which ranges the windows that light the nave are pierced. The principal dimensions are as follows:—Length of whole building outside, 53ft.; inside, 47ft. 8in.; length of nave, 30ft.; breadth of ditto, 18ft.; length of choir, 13ft. 8in.; breadth of ditto, 11ft. 6in.; height of the roof from ground outside, 52ft.; slant of ditto, 24ft.; mean thickness of the walls, 4ft. 1in.; length of square tower, 10ft.; breadth of ditto, 6ft. 8in.; height of ditto, 68ft. These dimensions are given the more minutely, as Cormac's chapel is by far the most perfect specimen of this description of building in these islands, and as it gives a convincing proof not only of the existence but of the excellence of some works in stone and lime, exclusive of round towers, in Ireland before the coming of the English.

Donat O'Lonargan, the first bishop of Cashel who received the archiepiscopal pall, was succeeded in the see (1152) by Donald O'Hullucan, in whose time (1172) the great synod was held here, which has been so much celebrated by the early historians of the conquest as that at which the Irish prelates are alleged to have recognised the civil authority of the English king and the ecclesiastical superiority of the Anglican church. By this time a town had grown up round the seat of authority, large enough to make its burning in 1179 worthy of mention in the Irish annals. The next archbishop was Donat O Lonargan the second, who assisted at the council of Lateran (1215), and died there. He was succeeded by his namesake, the third archbishop of the name, who erected the town of Cashel into a borough, in 1223. His successor, Marian O'Brien, having obtained a perpetual alms-gift of the town from King Henry III., regranted and confirmed the same to the provost and burgesses, reserving only to himself the bakery and shambles (1230), in return for which the citizens made a grant of two gallons out of every brewage of ale in their town, for ever, towards the support of a lazar-house, founded about this time by David de Latimer, the archbishop's seneschal. Marian was succeeded (1253) by David Mac Carwell, who (1268) granted an indulgence of forty days to all such as would contribute to the erection of the church of *St. Paul's*, in London. This prelate, who was somewhat of a turbulent character, forcibly expelled the occupants of the lazar-house founded by Latimer, and converted it into a monastery of black monks. He was engaged in various disputes with the government, but was a great benefactor to the church; he founded the Chauntry of St. Nicholas, the Abbey of the Rock of Cashel, and Hoar Abbey, a monastery for Cistercian monks, in the vicinity of the town, the ruins of which, still standing, attest its former splendour.

Cashel now seems to have attained considerable importance as a town; for by an assize taken, 7 Edward II., on occasion of a dispute relating to the above-mentioned grant of ale, it appears that there were at that time thirty-eight common brewers, or brewers of ale for sale, in the town. It was however unfortunately situated in one respect, being upon the borders of the Butlers' country, and exposed in their wars with the family of Desmond to the hostile neighbourhood of the Fitzgeralds. In one of the frequent disputes between these turbulent families, David Creagh, who had become archbishop in 1483, rendered himself by some means obnoxious to Gerald Fitzgerald, the great Earl of Kildare; the consequence of which was, that Gerald, about 1495, burnt down the cathedral, after probably devastating the town. Creagh, countenanced by the Earl of Ormonde, the chief of the Butlers, laid his complaint before King Henry VII., who, taxing Kildare, then present in council, was answered by the audacious noble, that 'By —— he would never have thought of committing such a sacrilege, had he not been told for certain that the archbishop was inside.' This characteristic reply is said to have gained him the good will of the king, who shortly after created him lord deputy, alleging that, 'if all Ireland could not govern him' (which was the gist of his rival's complaint), 'he was for that very reason the fittest man to govern all Ireland.'

There is little of interest in what is known of Cashel till shortly after the Reformation, when James Mac Caghwell, who had been nominated to the see by Queen Elizabeth, was stabbed to death by Maurice Gibbon, or Maurice Reagh, his titular rival (1570). His successor was Miler Magragh, who, after having for some time filled the see of Down as titular bishop, embraced the reformed religion, and was advanced to the dignity of archbishop of Cashel by the queen. This see he held from time to time *in commendam* with Lismore, Emly, and Waterford, and died here (1612) aged 100. He is much censured for having alienated a considerable part of the property of the see. By some he is supposed to have died a Roman Catholic. His monument is shown on the south side of the choir, but his body is said to have been privately interred, according to the rites of the Roman Catholic church, elsewhere.

In the wars subsequent to the rebellion of 1641, Cashel was for some time garrisoned, and the rock put in a state of defence by Lord Taaffe, on the part of the Irish royalists; but Lord Inchiquin, who commanded the Irish parliamentary forces, having taken Cahier, which was at that time considered the key to Tipperary (1647), assumed a position so threatening that Lord Taaffe thought it expedient to withdraw from Cashel, leaving only a small garrison to aid the inhabitants in their defence. On Inchiquin's approach the city was deserted, and the people, leaving their gates open, fled to the cathedral, either as a citadel or as a sanctuary. Here they were summoned to surrender; and Inchiquin offered them liberty to depart on condition of their paying 3000*l.*, and furnishing a month's provision for his troops. The terms being refused the place was carried by assault, with a great slaughter of the besieged, of whom above twenty priests and friars were slain before the assailants gained possession of the cathedral, when at length quarter was given, and the survivors suffered to return to their homes. The city was again taken by Cromwell, after which its annals afford nothing historically remarkable. In common with every other town of Ireland, Cashel reaped the advantages of the settled state of society consequent on the revolution of 1688, and up to the end of the last century seems to have been a flourishing place.

At present the city is in a state of lamentable decay, which is as much owing to the inefficient constitution of its corporation as to any other cause. The history of the corporation of Cashel furnishes the most striking example to be met with in this country of the evils arising from a corrupt municipal system. Their governing charter was granted 15th Charles I. (in 1640), and erects the borough into a city, to be governed by a mayor, aldermen, bailiffs, and commons. This charter was repealed by the 5th James II., which recites a seizure of the franchises of the city into the king's hands by a judgment of the court of Exchequer; but in 1690, King William having his camp at Goldenbridge, not far distant, was memorialized on the subject of their displacement by the mayor and commons, whereupon he gave them a letter restoring them to their antient rights and privileges as in the time of Charles I. The estates entrusted to this body for the benefit of the city consist of nearly 4000 statute acres of arable land, worth at least 20*s.* per Irish acre per annum, and of which upwards of 1700 Irish acres were out of lease so recently as 1831; yet the rents at present arising out of this great tract of land, which under proper management should produce a sum sufficient for all the purposes intended, amount to no more than 219*l.* 18*s.* 10½*d.* per annum. From the "Report of the Commissioners on Municipal Corporations in Ireland" (inquiry held in November, 1833), it would appear that this very inadequate return has been caused by the disposal of large holdings to members of the corporation at rents which may be termed nominal: particularly of 1548 acres, 2 roods, [illegible] poles, lately leased to an influential individual for ninety-nine years, from the 25th of March, 1830, at a rent of [illegible] 9d. per annum; the board of aldermen who made the order for the lease consisting of the grantee, two of his sons, seven other of his relatives, and one alderman connected with him by marriage. In consequence of this alienation of the public property, and from the mayor and aldermen having converted to their own uses the tolls and customs of the city, the public works of Cashel have fallen into a state of ruin almost unexampled in the kingdom. The streets are unpaved, unlighted, and uncleansed. There is no supply of water but by pumps repaired at the expense of the county. The water-works*, erected in the early part of the last century by Archbishop Bolton, have gone completely to decay; the underground conduits, upwards of two miles in length, are choked up or obliterated, and the stream is diverted to the supply of mills in the neighbourhood. It is affirmed that 500*l.* would be sufficient to supply the city with this most necessary element. There is no corporate police; their place being supplied by county constabulary. There is no institution for the support of the poor, of whom several hundred daily leave the town on begging excursions among the small farmers of the neighbourhood, and return at night to their hovels in the suburbs. The appearance of Cashel fully proves the neglect complained of. Although the main street is broad and handsome, the remainder of the town is mean. Out of 1135 houses, 751 are thatched; 76 are uninhabited, and 190 only are worth 10*l.* and upwards per annum. There is here a pretty good barrack, a dispensary, and a well-regulated bridewell, unconnected with the corporation. The new cathedral, built about the middle of the last century by Archbishop Agar (the old cathedral having been unroofed by Archbishop Price in 1752, and consequently gone to ruin), is a handsome structure, and stands within the town: the organ cost 600*l.*, and is a fine instrument. The archbishop's palace is a respectable mansion with very fine gardens, extending to the foot of the rock.

In 1831 the population of Cashel was, males 3279, females 3692, total 6971—in all 1364 families; of which 511 were chiefly employed in agriculture, 596 in trade, manufactures, and handicraft, and 257 not included in each denomination, but chiefly paupers. The proportion of Roman Catholics to Protestants in Cashel is about 30 to 1. The charter school of Cashel is an extensive and commodious establishment, with an income of 20*l.* per annum, and 22 acres of land annexed. In 1826 there were in Cashel 4 Protestant and 20 Roman Catholic schools, educating 697 males and 391 females; and in 1833 there were in the entire deanery, which extends considerably beyond the city, 20 schools, of which 2 were in connection with the national board, educating 743 males and 636 females. There is no published history of Cashel.

The local taxes levied here are tolls, corporate customs, and church rate. (Ware's *Works*; Ledwich's *Antiq. of Ireland*; Carte's *Life of Ormonde*; *Post-Chaise Companion*; Inglis's *Ireland in* 1834; *Parliamentary Reports and Papers*; *MS. in Lib. Roy. Irish Academy.*)

CASHEW-NUT. [ANACARDIUM.]

CASHMERE, the most extensive of the alpine valleys of the Himalaya range, lies embedded in high mountains, between 33° and 35° N. lat., and 74° and 77° E. long. It extends from S.E. to N.W., according to Rennell, between 74 and 75 miles, and its breadth varies from 15 to 36 miles, when the declivities of the mountains are included. In the middle of the valley, near the capital, Sirinagur, there is a level plain some miles in width, which seems to have been once a lake. The waters apparently at last broke down the rocks at the N.W. extremity of the valley, and found their way to the lower plain of the Punjab. This plain is surrounded by high hills, with rather a gentle slope, and covered with fine large trees and excellent pastures. Behind them rise the mountains far beyond the snow-line, especially in the upper end of the valley. The height of these mountains has not been determined.

Almost innumerable rivulets descend from the sides of the mountains on the margin of the snow-line, and are abundantly filled with water at all seasons. They join, in the centre of the valley, a river, which rises at the S.E. extremity of the valley. This river, called the Jhylum, or Behut (the Hydaspes of Alexander), has at Sirinagur, about 60 miles from its source, so much water, that Bernier compares it with the Seine at Paris; and adds that it is navigated by vessels as large as those near the capital of France. Its course through the plain is gentle, and it continues so to the lake of Wuller, issuing from which in a westerly direction, the river enters a hilly country, where it is soon narrowed by steep rocks. It forms several rapids and cataracts, until it reaches Muzufferabad, a town which belongs to the Punjab. The Jhylum joins the Chinaub (Acesines), and flows into the Indus. The lake Wuller has a circuit of about 40 miles. It is partly surrounded by extensive forests, in which there are numerous wild animals. From these forests the inhabitants get their timber. Near the capital is another lake called Dull, which, though shallow, seems to be of considerable extent; it is divided by dams into several parts, and contains many floating islands.

Numerous canals intersect the plain in every direction, which, besides watering the contiguous lands, afford great facilities to communication, being large and deep enough to be navigated by river barges. Cashmere is noted for the mildness of its climate, on which account it was chosen by the emperors of Delhi for their summer residence; but it appears not to deserve this praise, except in summer, when the heat, though great, is less oppressive than on the banks of the Ganges or Jumna. The winters are of course cold in a valley which is 6000 or 7000 feet above the sea. In 1822 Moorcroft found that snow began to fall in the middle of December, and the plain was not clear of it before the end of March. The sky during the winter months (from December to March) is so cloudy that the sun, on an average, is not seen oftener than once in three or four days, and then only for a short time. Towards the end of March and in April it is more frequently visible, but attended by a rapid succession of gusts of wind with hail. In May, 1823, scarcely a day passed without a shower; and Moorcroft observed, that he never had seen an atmosphere so frequently loaded with moisture. June, July, and August are hot; but the mornings, evenings, and nights are generally cool. Sometimes, though rarely, a failure of the rice crop has been experienced, owing to the summer heat not lasting long enough to ripen the grain. Cashmere produces wheat, barley, buck-wheat, millet, maize, pulse, and rice. Rice is raised in the greatest quantity, and may be considered as the staple. It is grown at a considerable elevation on the declivities of the mountains, as the streams which descend from their sides afford facilities for watering the fields. The lower classes live partly on the singhara, or water-nut, which, during eight or nine months of the year, is fished from the bottom of the lake Wuller. The mucilaginous pith of the water-lily (*Nymphæa lotus*) also supports a considerable number of people during eight months. Turnips, spinach, loose-leaved cabbages, and lettuces of the same description, are raised in the usual way; and cucumbers, gourds, and melons, in great quantities, by the ingenious and simple contrivance of platforms floating on the lakes. These swimming beds are commonly two feet thick, seven broad, and of considerable length. They resemble, in some respect, the swimming beds observed by Humboldt on the lake of Chalco near Mexico, where they are called *chinampas*.

Among the cultivated plants the crocus is the only one which furnishes an article of export, the saffron of Cashmere being known in all parts of western Asia.

The principal fruits are apples, pears, quinces, apricots, plums, cherries, and a nondescript species of grapes, called sungut by the natives. This grape yields, by distillation, a beverage which, in the opinion of the Chinese, is not inferior to that of the grape. Common grapes also abound, and the wine which is made resembles Madeira. Most of these fruit-trees cover large tracts of ground on the declivities of the hills, and have no owners: the fruit is gathered by the lower classes, and often constitutes their principal subsistance. It is thought that they are the remains of gardens which have been deserted.

No trees are cultivated with any care except the walnut, of which there are three different kinds. The kernel is eaten, and used for making oil; and the husks of the fruit are employed in dyeing black. Cashmere is famous for its flowers, especially roses, which are cultivated with care, and [illegible] *otter* is extracted.

[illegible] are not numerous, and are of a small size, but hardy. More attention is paid to black cattle; the breed is not large, but gives abundance of milk. Sheep are very plentiful, and their flesh well flavoured: goats abound in different places. In winter sheep are fed upon the leaves of several trees, which have been dried in the preceding summer.

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* "This," says Dr. Smith, in his collections for Tipperary, "is a work truly [illegible] and [illegible] the name of the donor to ages [illegible] [illegible]

Neither poisonous nor carnivorous wild animals are said to exist in Cashmere; but the forests abound with some kinds of deer, and the rivers with fish and water-fowl. Bees are very numerous, and each farmer has several bee-hives in the walls of his house, and sometimes as many as ten. These hives are of a cylindrical form, and extend quite through the wall of the house. Silk-worms are reared, but probably less than formerly, when silk was an article of export, which modern travellers do not mention. The metals are iron, which is abundant, but not of good quality; and copper and lead, which are said to exist, but are not worked.

The population of Cashmere is estimated to amount to 600,000. It consists, with few exceptions, of the natives, who appear to be of Hindu origin, though some authors think that the Cashmerians, as well as the Afghans, are descendants of the Jews. Their language, which is evidently derived from the Sanscrit, is pronounced with even more harshness than that of the Maharattas. The Cashmerians are very industrious, which is shown in the excellence of their cultivation, and the perfection which their manufactures have attained. In this they resemble the Hindus, but they are also very fond of amusements, and ready to expend what they have gained. They are very fond of music. The principal branch of industry is shawl-making, in which 60,000 individuals are employed, though the number of looms, which 200 years ago amounted to 40,000, has been reduced to 16,000. Two weavers work at each loom, when the shawls are simple; but when they are of a superior kind, four persons are required. According to an estimate, 80,000 shawls are annually made. Paper is also manufactured, and though less is now exported than formerly, it is still considered as the best made in western Asia. The Cashmerians work with great skill and taste different objects in wood, which, as well as lacker-work, are exported to the neighbouring countries. The extraction of the attar of roses is also an important branch of industry. The commerce of the country seems to be limited to the exportation of the manufactured goods, and the importation of wool from Tibet, and of metals from India, and perhaps from Persia. The transport of goods over the high mountains is chiefly effected by men, who carry them on their backs. Between Cashmere and Ladak sheep are used to carry burdens.

Sirinagur (Sranagara), the capital, contains from 150,000 to 200,000 inhabitants. It is nearly in the centre of the plain, on the N.E. bank of the Jhylun, and is traversed by two small rivers. The streets are narrow and dirty. The houses are built of wood, and commonly four stories high, and sometimes higher. The ground-floor serves as stables, and for agricultural or other utensils. The family live in the first-floor, and the third and fourth are used as magazines of goods and provisions. The roofs of the houses are covered with tulipan beds. There is no good public building.

Islamabad, higher up the river Jhylun, is also a considerable town, situated on the right bank, where the river becomes navigable for barges.

Sampre, likewise a populous town, is also on the right bank of the Jhylun, but below, about twelve miles, Sirinagur.

Cashmere seems to have formed an independent kingdom up to the thirteenth or fourteenth century, when it was subjected to the Gaznevides, and afterwards united to the dominions of the emperors of Delhi. When that empire was destroyed, about the middle of the last century, Cashmere was taken by the Afghans, who remained in possession of it till recently, when it became a part of the extensive dominions of the Maharaja Runjeet Sing, the sovereign of the Seiks. (Bernier; Forster; Moorcroft in *Geographical Journal*.)

CASI. [BIRMAN EMPIRE.]

CASIMIR I., son of Miceislaus II., king of Poland, was a minor at his father's death in 1034. His mother Rikscha, niece of the Emperor Otho III., assumed the regency, but the Poles being dissatisfied with her government, she was obliged to fly with her son into Germany, from whence Casimir proceeded to France, where he entered the Benedictine order of Cluni. In 1041 he was recalled by his subjects, who prevailed on the Pope Benedict IX. to absolve him from his vows, upon which he married Maria, sister of Jaroslaw, grand duke of Russia. Casimir defeated the Bohemians, and took Silesia from them. He founded a bishopric at Breslau. He did much to civilize the Poles, and he introduced among them his former brethren the Benedictines of Cluni. After a reign of eighteen years, he died in 1058, and was succeeded by his son Boleslas II., styled 'the Bold.'

CASIMIR II., younger son of Boleslas III., succeeded his brother Miccislaus III., who was deposed by the nobles for his tyrannical conduct in 1177. He defeated the Prussians, who were then heathens, and were very troublesome neighbours to the Poles, and he obliged them to adopt the Christian faith. He died in 1194, and was succeeded by his son Lesko V.

CASIMIR III., called 'the Great,' succeeded his father Wladislas in 1333. He conquered the Russians, and annexed the greater part of their country to the crown of Poland: he also defeated the Bohemians. He married Anne, daughter of Gedemin, grand duke of Lithuania, and died in 1370, leaving no issue. In him the male line of Piast, which had held the crown of Poland since 820, became extinct. Lewis, king of Hungary, the son of Casimir's sister, succeeded him on the throne of Poland.

CASIMIR IV. was the second son of Jagello, grand duke of Lithuania, who married Hedwige, daughter of King Lewis, and thus became king of Poland under the name of Wladislas IV. Casimir succeeded to the crowns of Poland and Lithuania after the death of his brother Wladislas V., who lost his life in the battle of Varna against the Ottomans in 1444. Casimir made war against the Teutonic knights, and took from them a great part of Prussia; upon which the grand master of the order acknowledged himself a vassal to the crown of Poland. The duke of Vallachia also about the same time made allegiance to the same crown. It was under Casimir that the deputies of the provinces first appeared at the Diet of the kingdom of Poland. (Puffendorf.) This was the epoch of the greatest splendour of that country. Wladislas, son of Casimir, was made king of Bohemia and of Hungary. Casimir died in 1492, and was succeeded by his second son John Albert. It was Casimir who enforced the use of Latin as the official language of Poland.

CASIMIR V., son of Sigismund III., was elected king of Poland after the death of his brother Wladislas VII. in 1647. Casimir was then at Rome, where he had entered the church, and had become a cardinal. Having obtained a dispensation from the pope, he married Luisa Maria Gonzaga, his brother's widow. He made war against the Cossacks, and against the Russians, with various success. Casimir was attacked by Charles Gustavus, king of Sweden, who overran a great part of Poland, and defeated the Poles in a great battle near Warsaw. By the peace of Oliva in 1660 Poland gave up Livonia to the Swedes, and Smolensk and Kiew to the Russians. Casimir, seeing his subjects dissatisfied, abdicated the crown in 1667. He retired to France, where Louis XIV. gave him the abbacy of St. Germain des Prés, and other benefices. He died at Nevers in 1672. He was the last representative of the house of Jagello.

CASMARHYNCHOS. [PROCNIAS.]

CASPIAN SEA (the Κάσπια θάλασσα of the Greek writers) is properly an inland lake, which, in consideration of its waters being salt, must be placed among those lakes which are called steppe lakes. It lies along the boundary-line between Europe and Asia. It extends from its most N. point, near the mouth of the river Ural (47° 20′ N. lat.), to its most S. point, which is nearly at an equal distance between the towns of Resht and Asterabad (36° 40′), in a straight line about 740 miles; but a curve drawn through the centre, from its N.E. corner at the mouth of the river Elba Djem to its most southern shores, measures about 900 miles. The general direction of its length is from S. by E. to N. by W., but the northern part is curved to the E., and there forms a bay nearly as wide as the main body of the lake. Here its width from E. to W. is 430 miles, but its average breadth is only about 210. Its most eastern point is the Gulf of Mertwoi Kultuk, which extends to 54° 10′ E. long.: the bay of Kooma on its W. shore reaches to 46° 50′. Taking the length of the sea at 900 miles, and its average breadth only at 200, it covers 180,000 square miles, or nearly the area of Spain, not including Portugal

The Caspian Sea has very few bays. The most important are the Mertwoï Kultusk, or the Dead Sea, which forms the most eastern corner, and by one of its branches, the Tuik Karassu, encloses the peninsula of Manghislack on the E. Farther S., nearly in the middle of the E. shores of the lake, is a smaller lake, called Kooli Deria, which contains bitter water, and is united with the Caspian by an open strait. Still farther S. is Balkan Bay, where the antient mouth of the Amoo Deria or Oxus is said to have entered. [Oxus.] On the western side is the Bay of Salian, into which the Koor river disembogues; and farther N. the Bay of Kooma which contains the mouths of the Terek and the Kooma. At the mouth of the Volga, the largest of the rivers falling into the Caspian, there is no bay; the numerous islands formed by the stream project some miles into the sea.

The shores of the Caspian are in general so low and flat, that most parts are inundated when a strong gale from the opposite point blows for a few days. The highest shores are those of the peninsula of Abcheron, which projects on the western side from 40 to 50 miles into the sea; but even here they do not rise to a great height. The S. portion of the sea, from the peninsula of Abcheron to the Bay of Asterabad, the S.E. corner of it, is enclosed by high mountains, from 15 to 30 miles distant from the beach, between which and the water extends a low flat country. The E. shores are very little known, on account of their great sterility, and still more, because they are commonly skirted for 20 or 50 miles inland by a swampy tract, which can only be travelled on in winter when it is frozen. The peninsula of Manghislack forms an exception, having rocky but not high shores. From the Mertwoï Kultusk to the mouth of the Terek, and even to the peninsula of Abcheron, the beach is low, flat, and sandy.

The depth of water is considerable, especially towards the S. extremity, where it attains 600 feet, but towards the N. it is not so deep, owing to numerous sand-banks, which are a great impediment to navigation. In general the depth decreases considerably towards the shores, and in some places by terraces. This circumstance renders large vessels unfit for the navigation of the Caspian. Its waters are not so salt as those of the ocean. According to Gmelin, only 10½ ounces of salt can be extracted from 122 lbs. of water; and he thinks that the saltness of the Caspian is to that of the Atlantic as 1 to 4.

The navigation of this sea is confined to the countries lying on the W. shores between the mouth of the Volga and the town of Asterabad. The Russians of Astrakhan use brigs from 150 to 200 tons; but the Persians only small vessels, from 50 to 70 tons. The navigation is dangerous, owing to the prevalence of N.W. and S.E. gales, which sometimes blow with great violence for many days together. They raise the surface of the sea from 3½ to 4 feet along the shores on which they blow, and inundate the contiguous low countries to a distance of several miles. The fisheries give employment to the inhabitants of the adjacent countries. Numerous shoals of sturgeons, belugas (*Sturio huso*), sterlets (*Sturio ruthenus*), salmon, and other fish at certain seasons ascend the rivers, especially the Volga, where such large quantities are taken, that this fishery is thought to be only inferior to that on the banks of Newfoundland. Seals are common, and are taken on some islands and on the E. coast.

Naphtha or petroleum frequently occurs on the shores of this sea. In the peninsula of Abcheron the whole soil seems to be strongly impregnated with it. [Baku.] It is perhaps ound in still greater quantity on the island Naphthalia or Tchilehon, the largest of the islands of the Caspian Sea, situated in the Bay of Balkan.

The Caspian appears to be subject to some extraordinary changes in the level of its surface, which have not yet been completely investigated. The inhabitants of Enzillon, the port of the town of Resht, assured Colonel Monteith that it rises and falls several feet in periods of nearly thirty years; and Hanway has collected some facts to prove that in his time (1746) it had a much greater depth at several places than when it was navigated by the expedition of Peter the Great. Monteith himself observed in a few years a considerable decrease of its waters. There are no tides on the Caspian. The northern portion of it is annually covered with ice.

Since the middle of the last century it has been known that the surface of the Caspian Sea is lower than that of the ocean. It was observed, that in Astrakhan the barometer was generally above 30 inches. In 1812 an attempt was made by Engelhardt and Parrot to settle this question by a series of levellings and barometrical measurements. They effected this across the isthmus at two different places near the foot of Mount Caucasus. The result of one of these measurements was, that the Caspian Sea was 54 toises or about 348 feet lower than the Black Sea: the other gave a difference of 47 toises or about 301 feet. Some doubts have arisen respecting the correctness of these measurements; and in the present year (1836) the Russian government has granted the sum of 50,000 silver rubles to the Academy of Sciences for the purpose of ascertaining the truth by new levellings.

Pallas, if we are not mistaken, was the first who maintained that the Caspian Sea at some very remote period covered the extensive plain which lies between the most S. ranges of the Ural Mountains and the Black Sea. He inferred this from the peculiar nature of the soil, which consists of sand, partly unmixed with other kinds of earth, and partly containing a portion of clay loosely mixed with it. There is no grass upon it; and shells frequently occur which are met with in the Caspian Sea. It is also impregnated with salt, and contains a great number of smaller and larger salt lakes, among which that of Elton is the best known, from which large quantities of salt are annually procured. This plain is bounded on the N. by a wall-like ascent, elevated at an average 300 feet above it, which, in the peculiar form of its margin, resembles very much that of the coast of the sea. This ascent extends from the S.W. extremity of the Ural Mountains, the Obshtshei Syrt, in a S.W. direction, crosses the Volga below its great bend to the E., and divides the source of the small river Sarpa (an affluent of the Volga) from that of the Manytsh. Hence it runs W., and terminates not far from the confluence of the Manytsh with the Don. According to appearances, it is very probable that when the surface of the Caspian Sea was at a higher level, there was a passage along the present course of the Manytsh river between the Caucasus and the above indicated ascent, which united the Caspian and the Black Sea. Engelhardt, who determined by a series of levellings, and by barometrical measurements, the difference in the level of the two seas, estimated the source of the Manytsh to be only 16 toises, or 102·4 feet above the Black Sea, and consequently 450 feet above the Caspian.

It may be supposed that the Sea of Aral once formed a part of the Caspian; for though at present the sandy hills between them rise to the height of several hundred feet, it is not improbable that these heights have been formed by the accumulation of sand brought down by strong E. gales, which are very frequent in these countries. If this is admitted, it is not improbable that there existed a communication between the Caspian and Arctic Seas; for Humboldt, in his 'Fragmens Asiatiques,' has traced out a comparatively narrow low tract of land, which extends on the E. side of the Ural Mountains from the N. part of the Sea of Aral between the rivers Ishim and Irtish, through the steppe of Baraba, and thence on the W. of the Oby to the swampy coasts of the Arctic Sea. This low ground has not been examined, but is indicated by a continuous series of lakes.

The Caspian was known to the Greeks and Romans. Herodotus (i. 203), the first who mentions it, calls it the Caspian Sea, a name probably derived from the Caspii, who inhabited its southern coast. This name it has preserved, though later writers limited the term Caspian to the W. portion, calling the E. the Hyrcanian Sea. Herodotus gives a pretty just idea of its extent, stating that its greatest width was about one-half of its length; but as Niebuhr has properly remarked (*Dissertation on the Geography of Herodotus*), he does not give any hint as to the *direction* in which the length and breadth respectively lie. Aristotle (*Meteorologica*, chap. 2) does not differ from the historian in his opinion as to the Caspian lake; but about this time an opinion began to prevail, that the length of the Caspian Sea was in the direction from E. to W. About the same time also it became a general notion that the Caspian was connected with the Arctic Sea by a strait, an opinion which seems to have arisen from some slight information obtained respecting the mouth of the Volga. It was said that the strait was only four stadia wide. Ptolemy, who knew the Volga, which is named by him 'Rha,' does not mention the existence of this strait, though he still thought that the greatest extent of the Caspian was from W. to E. This form of the Caspian is preserved on all our more antient maps, up to the beginning of the last century, when Peter the Great sent an expedition to explore the sea. (Pallas; Engelhardt; Humboldt; Col. Monteith, in *London Geogr. Journal.*)

CASSANDER was the son of Antipater, to whom Macedonia was allotted on the division of the Macedonian empire after the death of Alexander. Antipater dying, B.C. 318, appointed Polysperchon to succeed him. [ANTIPATER.] Cassander bore this exclusion with indignation; but finding his party too weak for successful opposition, he fled to Asia, and sought the assistance of Antigonus and Ptolemy. Antigonus gave him 4000 men, with whom he sailed to Athens, and was received by Nicanor, the Macedonian governor of the port and fortress of Munychia, who had recently, by a sudden attack, obtained possession of the chief part of Piræus also. Polysperchon lost no time in conducting an army to besiege him, but was soon obliged, by scarcity of provisions, to draw off the greater part of his troops into Peloponnesus, leaving only an army of observa- [illegible] Attica. Almost the whole of Peloponnesus favoured [illegible] chon: Megalopolis however remained firm to the [illegible] Cassander, and defended itself with such resolution [illegible] rival was compelled to retreat from under its walls [illegible] mortification and disgrace. Parties were so balanced in Greece, that a slight thing was enough to turn the scale in favour of one or the other. 'Polysperchon falling into disgrace through this failure (says Diodorus, xviii. 74), most of the Greek cities went over to Cassander;' and, among the rest, Athens, seeing no chance of recovering possession of its ports by force of arms, B.C. 317.

In the following year, Cassander marched into Macedonia against Polysperchon, who, with the view of strengthening his party among the Macedonians, had associated with himself Olympias, the mother of Alexander. Leaving Callas, his general, to oppose Polysperchon, Cassander himself blockaded Olympias in Pydna during the winter. That town yielded on capitulation early in the year B.C. 315, when Olympias, in express contravention of the terms of surrender, was put to death through his agency. Having now gained possession of Macedonia, with the power, though not the name, of a king, he took to wife Thessalonice, the daughter of Philip and half-sister of Alexander, in hope of confirming his own ascendency by the powerful associations connected with the royal blood. In the same year he founded the flourishing city of Cassandria, in Pallene, which was formerly known by the name of Potidæa, and commenced the restoration of Thebes, twenty years after its destruction by Alexander. Soon after he joined the combination of Ptolemy, Lysimachus, and Seleucus, against Antigonus. The war which ensued was concluded, B.C. 311, on condition, so far as related to Cassander, that he should be military governor (στρατηγὸς) of Europe, till the son of Roxana by Alexander should attain his majority. This limitation Cassander made of no avail by immediately putting to death both the young prince and his mother, B.C. 309. Polysperchon set up another rival to him, in the person of Hercules, the only surviving son of Alexander by Barsine; but he agreed to put Hercules to death on condition of Peloponnesus being given up to him. Hercules was accordingly murdered, but Polysperchon was not able to take possession of Peloponnesus, which was the stipulated price of his treachery.

No part of history is more complicated, and less interesting, than that which relates to the wars of Alexander's immediate successors. We therefore pass over the constant employment given to Cassander by the confirmed enmity of the Ætolians, and by the disturbances continually fomented in Greece by Antigonus.

During the Rhodian war [ANTIG., p. 103], Cassander regained much influence in Greece, which he had lost by the intrigues of Antigonus and the military successes of his son Demetrius. But after the siege of Rhodes was raised, Demetrius again repaired to Greece, and, in the year 302, became master of the greater part of Peloponnesus. The danger in which Antigonus was involved by the second confederacy of Ptolemy, Seleucus, &c., recalled Demetrius to Asia; and the death of Antigonus at the battle of Ipsus, B.C. 301, removed Cassander's most formidable enemy. From that time forwards, he held secure possession of Macedonia, though Demetrius retained considerable influence in Greece. He died B.C. 296, leaving the character of an ambitious, able, unscrupulous man, of whom the best that can be said is, that his rivals were no bett[illegible]

He was succeeded in Macedonia by Philip[illegible]

CASSATIO'N, 'the reversal of a judicial sentence,' is a French law word, derived from 'cassare,' which, in the barbarous Latin of the lower ages, was synonymous with 'irritum reddere,' 'to annul.' (Ducange.) In the early times of the monarchy, petitions were presented to the various provincial parliaments by appellants from the decisions of the lower courts. The decisions of the parliaments on these petitions were liable to be annulled by lettres d'état issued by the king's council. This however gave rise to abuses, and the chancellor De l'Hôpital limited the use of the lettres d'état. By the order of procedure established under Louis XIV. in 1667, two modes of setting aside the decisions of the parliament were finally adopted; one was by 'requête civile,' which annulled a decision and restored the parties to their previous condition, in consequence of either fraud or legal mistakes being discovered [illegible] proceedings; and the other was by 'cassation,' in consequence of a violation of either the principle or form of the law in the decision of the court. In the latter case the cause was tried anew in a council consisting of the chancellor, the four secretaries of state, the council of state, and the maîtres de requête. The national assembly, in November, 1790, abolished this system, and established a distinct, permanent, and independent court, called Tribunal de Cassation, which afterwards received its full organization under Napoleon, and has ever since continued under the name of Cour de Cassation. It is the highest court of France, and receives appeals from all other courts. It consists of 48 members, who, by the charter of Louis XVIII., are appointed by the king, but retain their places for life. The court has its president, although on certain occasions the keeper of the seals, or minister of justice, has the right of presiding in it. It is divided into three sections: 1°. Section des Requêtes, which examines whether the petitions or appeals are to be received. 2°. Section de Cassation civile, which decides upon appeals in civil cases. 3°. Section de Cassation criminelle, which decides upon appeals in criminal matters. The sections do not decide upon the main question, but only on the competency of the other courts, and the legality of the forms and principle of law by which the case has been already tried. If the law is found to have been violated, the sentence of the inferior court is annulled, and the case is sent to be tried again by another court. If this second court decides the case in the same manner as the first, and a petition against the decision is again laid before the Court of Cassation, then the three sections unite together in order to examine the case anew, and if they find reason to pass a second reversal, the case is sent to be tried before another court. Should this third court decide in the same manner as the other courts, and a petition against the decision be again presented to the Court of Cassation, the court requests a final explanation of the law on the point at issue from the legislature.

The institution of the Court of Cassation has proved highly beneficial to France; it has acted as a watchful guardian of the laws; it has afforded protection to the citizens against the arbitrary acts, and the misjudgments or misconstructions of the other judicial courts of the kingdom. Placed by the nature of its office out of the immediate influence of political passions, it has maintained its high character for strict impartiality throughout all the changes of government and administration. Many of the most distinguished jurists of France are numbered among its members. We can only mention here the names of Henrion de Pansey, who was long president and is known for his juridical works, and Merlin de Douai, who was procureur to the court, and is the author of the 'Répertoire de Jurisprudence,' 16 vols. 4to.

CASSA'VA, or Manioc, a nutritious fecula obtained from the roots of jatropha, or janipha manihot, and some allied species. This plant, belonging to the natural order Euphorbiaceæ, abounds in a highly poisonous juice, very small doses of which produce the most dangerous consequences; it is however of so volatile a nature as to be entirely driven off by heat, and consequently there is no practical difficulty in procuring the nutritious substance in a pure state. In order to effect this the roots are peeled, well washed, and then ground between millstones till they are reduced to the state of paste. This is subjected to pressure for the purpose of depriving it, as far as possible, of the juice; the residue is placed in vessels over a brisk and regular fire, and continually stirred, until it becomes dry; it then acquires a granular appearance, is gradually cooled, and afterwards packed in barrels, when it may be preserved for a great length of time. Half a pound of this substance daily is said to be sufficient to support a vigorous man. Tapioca is a preparation of Cassava. For the manner of preparing the various substances yielded by the janipha, see Aublet's *Plantes de la Guiane Française*, vol. ii. Supp. p. 65.

CASSEL, HESSE, ELECTORATE OF. [HESSE CASSEL.]

CASSEL, the capital of the electorate of Hesse Cassel, in the province of Lower Hesse, lies on the Fulda, which is navigable, and over which there is a stone bridge. It is surrounded by walls on every side except that which is bounded by the Drusel. It has 11 large and small gates, and is divided into the Old Town, Upper New Town, and Lower New Town, and the three suburbs of Wilhelmshöhe, Frankfort, and Leipzig. The Old Town is a collection of crooked, narrow streets, which are rendered still darker by the height of the houses, and are not kept clean. Cassel is the great seat of trade and manufactures for the electorate. It contains the spacious square called the Palace Square, which is 900 feet long and commands a prospect of the beautiful valley of the Fulda; the market-place; the Electoral Palace, almost entirely destroyed by fire in 1811, on the site of which stands the new and unfinished residence termed the Kaltenburg; the Renthof, consisting of public offices, the old town-hall, the government buildings, the Stadtau, appropriated to public amusements, the packing-hall, and the furniture-hall, or Möbeln-Kammer. There are likewise St. Martin's Church, with the catacombs beneath it, in which the remains of the sovereigns of Hesse Cassel are deposited; the Lutheran, the Brethren's, and the garrison churches; a synagogue, an orphan asylum, and an hospital: an arsenal, foundry for cannon, a house of correction, and other public establishments. The Upper New Town is the finest quarter of Cassel, and may vie in splendour with any city in Germany. It contains the Friedrichsplatz (or Frederick's Square), 1000 feet in length and 400 in breadth; the boulevards; Charles Square, with the marble statue of the Landgrave Frederick; King's Square, of an oval form, 466 feet in diameter; the Royal Street, nearly a mile long, which passes through the centre of the square, the halls for trading purposes, and other handsome buildings; the barracks; William and Gardes-du-corps Squares; and the street of Bellevue, which overlooks a splendid country. Among other edifices in this quarter are the museum, which is considered the finest structure in the town, and contains an extensive library, collections in numismatics, natural history, antiquities, experimental philosophy, &c., and an observatory; the picture-gallery, the Bellevue Palace, the palaces of the elector, electress, and crown prince and princess, as well as of the Wilhelmshöher Rondele; the electoral stables and riding-house, town-hall, mint, cadet academy, lyceum, a normal and civic school, theatre, the New Town and Roman Catholic churches, an hospital and infirmary, a poor-house, six ranges of barracks, &c. The Lower New Town is the site of the Castell, an antient structure surrounded by walls and a ditch, for the safe custody of state and military offenders: it contains the Lower New Town Church, a Protestant orphan-asylum, infirmary, lying-in-hospital, house of correction, common prison, &c.

In the Leipzig suburb are an hospital, an infirmary, and a spacious building with laboratories; in the Frankfort suburb, a bridewell or house of industry, poultry-hall, &c.; and in the Wilhelmshöher suburb, a large hospital, which was originally designed for barracks for 6000 men. The whole town, including the suburbs and two settlements called the Philippinenhof and Momorade, contains 18 squares, 51 public buildings, 9 churches, comprising the Roman Catholic Chapel, a synagogue, 6 schools, 11 charitable endowments, 25 buildings for military purposes, 6 prisons, and about 27,000 inhabitants, among whom are about 500 Jews.

In 1792 the population, inclusive of the military, was 18,400; but in 1812, when Cassel was the capital of the kingdom of Westphalia, it was 23,167. Independently of the establishments already mentioned, Cassel possesses an academy of arts, with schools of painting, sculpture, and [illegible], a society of antiquarians, an agricultural association, a bible society, and a medical college. The manufactures of the town, none of which are on an extensive scale, consist of silks, cottons, hats, tobacco, earthenware, refined sugars, woollens, gloves, cutlery, &c. Cassel has two large fairs annually, but although it lies on a navigable river, and is centrically situated between the Hanse towns, it is not the seat of any great trade. It abounds with public walks, such as the esplanade next the Palace Square, and boulevards adjoining Frederick's Square; without the town is the Aue or public mall, with marble baths, a handsome villa, a fine orangery, and grounds in which animals and wild fowl are kept; and the villa of Schönfeld in front of the Frankfort suburb, the wood of pines, and several public gardens. Every great road about Cassel has avenues of trees. Cassel is about 81 miles N.E. of Coblenz; 51° 18′ N. lat., 9° 30′ E. long.

CASSEL. [NORD, DEPARTMENT OF.]

CA'SSIA (from the Greek κασσία, *cássia*), a genus of leguminous plants, consisting of a large number of species, chiefly inhabiting the tropical or temperate parts of the world, and including among them the plants that produce the senna leaves of the apothecaries. Cassia belongs to sub-order Cæsalpineæ of Leguminosæ, and is characterized as follows by De Candolle:—Calyx consisting of five sepals which scarcely adhere at their base, but are more or less irregular. Petals five, unequal in size: stamens ten, distinct from each other; the three lowest being the longest, the four intermediate ones shorter and straight, and the three uppermost deformed. Such of the anthers as are perfect open at the point. Ovary stalked, usually curved. Legume variable in form. The species consist of trees, shrubs, or mere herbs; the leaves are simply and abruptly pinnated, and usually bear glands on their stalks. The leaflets are opposite each other. Between 200 and 300 species are described by botanists. We shall only notice those employed in medicine.

1. *Cassia fistula* is a small tree, with large yellow flowers growing in long loose racemes, having the aspect of a laburnum, and is found wild in India and the tropical parts of Africa. It has ovate taper-pointed smooth leaves, in from four to six pairs, and long smooth cylindrical dark brown legumes, containing a quantity of thick pulp, that collects into transverse partitions, which separate the seeds from each other. The leaves, flowers, and pulp of this plant are purgative, but they are not much employed in Europe at the present day.

2. *Cassia acutifolia*, a small under-shrub, with ovate lanceolate sharp-pointed leaflets, yellow flowers in terminal erect racemes, and compressed velvety legumes an inch long and half an inch broad. It is found wild in Egypt, Sennaar, and Abyssinia, and forms an important article in the commerce of those countries. It is chiefly sent to Alexandria for shipment, whence it has gained the name of Alexandrian senna among the drug-merchants. It is considered the most valuable of all the sennas.

3. *Cassia obovata*, or Aleppo senna, has obovate very blunt leaflets, and curved pods, with a very slight covering of down. The flowers are pale yellow. It is common in the same countries as the last, and mixed with it in commerce; it however chiefly constitutes the Aleppo senna.

4. *Cassia lanceolata*. Leaflets very narrow and acute; pods plano-compressed, straightish, a little tumid in the middle. Found wild in Arabia, whence it is exported under the name of senna of Mecca. It is a good deal cultivated in India, on which account, and from its being usually shipped for Europe from Indian ports, it has acquired the name of East Indian senna in the market. As a species it appears to differ very little, if at all, from C. acutifolia.

Of the different species of Cassia mentioned above, either the pulp or leaves are used in medicine. The pulp of C. Fistula, called also Cathartocarpus Fistula, consists chiefly of sugar and gum, with some other principles, and is a mild laxative. It accordingly enters into the composition of the confection of cassia, and the confection of senna or lenitive electuary. These are pleasant-tasted but rather bulky purgatives for children. They are not much used, and the pulp of cassia is chiefly employed to form what is termed essence of coffee. This, when prepared from pulp which has not been kept too long, is mildly cathartic, and a very proper article of diet for persons subject to habitual constipation.

The leaflets of several different species of cassia belonging to the section Senna, constitute the various kinds of senna called senna leaves. In addition to the leaflets, the leaf-stalks and pods are frequently present, especially in the Alexandrian senna, which contains also the leaves and pods of a tephrosia, and the leaves, but rarely the follicles, of the Cynanchum Arghuel (Delile) C. oleæfolium (Nectoux), a plant of the tribe of the Apocyneæ, which possesses deleterious properties. The leaves of this last-named plant constitute two parts in ten of the senna of Alexandria. The Tripoli senna is free from it, as is likewise the Tinnivelly senna, which is now the best and cheapest in the markets of this country, and should always be preferred, as much of the griping tendency of common senna is due to the presence of the argel leaves. The senna leaves met with in the continental markets or shops are frequently adulterated with the leaves and berries of the Coriaria myrtifolia, a very poisonous plant.

When free from adulterations, senna furnishes a most valuable purgative medicine; but when impure, its action is accompanied with nausea, griping, and other unpleasant symptoms. It is desirable therefore to free it from impurities before administering it or subjecting it to the action of water to form an infusion.

Senna contains a peculiar principle called *cathartine*, with a fat oil, and a little volatile oil, a colouring principle, mucilage, and malate and tartrate of lime, chlorophylle.

The active or purging principle is yielded to water, both cold and warm, and to alcohol. If the infusion be made with cold water, it never gripes: this method is now much employed to form the concentrated infusions supplied by wholesale chemists and druggists to country practitioners. It requires that the water should stand twenty-four hours on the leaves, which should be kept down with a heavy weight, and the air excluded as thoroughly as possible. The compound infusion of the Edinburgh Pharmacopœia, if made with cold water, is a very good form, and even relished by children. The tincture is almost an unnecessary form, while the powder is objectionable from its bulk and disagreeable taste. Various articles, especially aromatics, are occasionally added to infusions to correct its griping tendencies, or increase its purgative power. The confection is an example of such combinations in a solid state. A carefully prepared extract keeps well, retains the odour and virtue for years, and may be given in moderate sized boluses or pills.

CASSIA BUDS. The unexpanded flowers, when they have attained about a fourth of their complete size, of a species of Cinnamomum, are collected and sold under this name. Much diversity of opinion exists respecting the particular species of Cassia which yields this article. Professor C. G. Nees von Esenbeck (who is perhaps the best authority) says it is chiefly C. aromaticum (Nees), and partially C. dulce (Nees), Laurus dulcis (Roxb.), Cinnamomum Chinense (Blume), while Dr. Th. Fr. Ludwig Nees von Esenbeck ascribes it to Laurus Tamala (Hamilton Linn. *Trans.*, xiii., p. 556, the L. Cassia, Hort. Beng.), and Dierbach to the L. Cubeba Lour., which last supposition is at variance with the statement of Loureiro (*Flora Cochinensis*, p. 310), respecting the action of the berries of that species.

Cassia buds have the appearance of nails with heads of different sizes and shapes, according to the period of growth when collected. But an artificial process is employed by the Chinese collectors, of pressing the top against a flat, hard body, by which the ovary or fruit is prevented falling out. Externally they are of a dark or greyish brown: the fruit which is within is of a bright brown. The taste and odour resemble cinnamon. By distillation they yield a heavy yellowish-coloured oil. It was at one time supposed that an inferior sort, nearly devoid of taste, which is met with in commerce, was the genuine, which had been previously deprived of its oil; but Martius showed that this was a spurious kind, which is distinguished from the true by having the upper part of the calyx marked by six slits or incisions. It is moreover not so round as the true sort, and is furnished with a longer foot-stalk.

The uses of cassia buds are the same as those of cinnamon and cloves. [Caryophyllus.]

CASSIA'NUS BASSUS. [Geoponika.]

CA'SSIDA, a genus of Coleopterous insects of the family Cassidiadæ. Technical characters:—Body generally somewhat oval or orbicular, and sometimes nearly square; thorax semicircular or forming the segment of a circle, the margins [illegible] considerably beyond and covering the head; the [illegible] also have the margins projecting, and forming, as it [illegible] kind of shield to the body; mandibles with several notches; the anterior maxillary lobe as long as the [illegible]ao. [Cyclica.]

CASSIDA'RIA. [Entomostomata.]

CASSIDI'ADÆ, Leach, *Cassidariæ*, Latreille, a family of Coleopterous insects of the section Cyclica of Latreille.

The species of this family are distinguished by their having the antennæ rather short, filiform or slightly thickened towards the apex, placed on the anterior part of the head, and almost close together. The legs are short and contractile; the tarsi are flattened, soft, and velvet-like beneath; the penultimate joint bilobed, the lobes completely including the terminal joint; body generally very flat. [Cyclica.]

CASSI'DULUS. [Echinodermata.]

CASSI'NI. We have now for the second time to sketch the lives and labours of a family of distinguished men, who, though their contributions to the stock of knowledge do not rival in extent or value those of the Bernoullis, present nevertheless a succession of talent and industry which rarely occurs. From the date of its establishment in 1670, till the time when the revolution destroyed all hereditary privileges, the Observatory of Paris passed from one Cassini to another through four generations, as though it had been transmitted by the law of property.

I. John Dominic Cassini was born at Perinaldo, in the district of Nice, June 8, 1625, of a respectable family which came from Siena, of which place a Cardinal Cassini was archbishop in 1426. He was educated by the Jesuits at Genoa, and there are some Latin poems of his in a collection of 1646. He attached himself to mathematics and astronomy, and also, it is said, to astrology, of which he was cured by discovering that a prediction which succeeded had been calculated wrongly. He also read the work of Pico di Mirandola against astrologers. In 1644, at the invitation of the Marquis Malvasia, who was building an observatory, he removed to Bologna, and in the university of that place, after the death of Cavalieri, in 1650, he succeeded to the chair of astronomy. He here observed the comet of 1652, on which he published his first work. He made various observations with a gnomon and meridian line constructed in a church at Bologna. In 1657 he was deputed, with another, ambassador to the pope, on a quarrel between Bologna and Ferrara relative to the river Po, and on his return was appointed to the superintendence of the river for the former place. In 1663 he was appointed to repair the works of Fort Urban. He was at this time patronized by Pope Alexander VII., and afterwards by Clement IX. In 1664-5 he made the first of his more brilliant and useful discoveries, namely, the time of the rotation of Jupiter, which he fixed at 9 hours 56 minutes. Professor Airy, by very recent observations, makes it 9h. 55m. 21·3s. He also saw, for the first time, the shadows of the satellites on the disc. [Campani.] By comparison of his own observations with those of Galileo, he constructed (1665) his tables of the satellites. In 1666-7 he found the rotation of Mars to be 24h. 40m (it is 24h. 39m. 21·3s), and in the same year he ascertained that the rotation of Venus, which is difficult to observe on account of her phases, does not differ much from that of Mars (it is 23h. 21m. 7s.). He made the *apparent* rotation of the sun to be about 27 days, which is very near the truth. These results show considerable skill and assiduity, and made the name of Cassini very well known throughout Europe.

When Colbert founded the Academy of Sciences, in 1666, and at the same time projected an observatory at Paris, he proposed to Cassini to remove into France, and offered him a pension equivalent to his Italian emoluments. Cassini expressed his willingness to comply if the consent of the pope (Clement IX.) could be obtained; which was done on condition that Cassini's absence should not last more than two or three years. He arrived at Paris April 4, 1669, and began his duties at the observatory September 14, 1671, where his observations extend from 1671 to 1683. In 1673 the Bolognese government, which had kept all his appointments open, required him to return; but Colbert succeeded in negotiating his continued stay in France, and accordingly in the same year he was naturalized in his new country, and married a French lady. He never returned to Italy, except for a short time in 1695, but remained at the head of the Paris Observatory. In the latter years of his life he was totally blind. He died September 14, 1712, without disease, and only, as Fontenelle remarks, *par la seule necessité de mourir*. His eldest son was killed at the battle of La Hogue; of his second we shall have to speak as soon as we have completed the present part of our subject. In 1671-2 he discovered the third and fifth satel-

[illegible] of Saturn, and in 1684 the first and second. His gnomon at Bologna led him to more correct solar tables than had been in use, and to more exact values of the refraction. He gave a more complete explanation of the lunar libration than either Kepler or Hevelius, particularly in the determination of the quantities concerned; and though he did not leave the actual observations, Delambre, who, as we shall see, judges him severely, appears to think that he *did* establish by observation the coincidence of the nodes of the lunar equator and orbit. He was the first who carefully observed the zodiacal light, which he imagines he discovered. His later tables of the satellites of Jupiter (1693 and 1693) were considerable improvements; but though in possession of facts analogous to those which led to the discovery of the motion of light, he not only did not make that discovery, but rejected it when announced by Roemer. For his arc of the meridian, his observations relative to refraction, with a multitude of other points too long to notice here, we must refer to Delambre, *Hist. d'Astron. Mod.*, vol. ii.

We have seen that Cassini, as an observer, was no ordinary man. Even if we leave out of view discoveries such as those of the satellites of Saturn, which though brilliant involve no extraordinary sagacity, we have still the continued, systematic, and successful observations of the satellites of Jupiter. But as a philosopher, and as a reasoner upon the results of his observations, Cassini does not excel. An obstinate follower of Descartes, we have no evidence that he ever looked into Newton; probably his mathematical knowledge was not sufficient to enable him to understand the Principia. A devoted, if not a bigoted, adherent of the church of Rome, he was a Ptolemaist long after the time when Galileo had made the speculation of Copernicus sound astronomical doctrine; and we cannot give much admiration to the power of a mind which enslaves itself to a church in a matter of science. His unskilful handling of Kepler's laws, his erroneous and unsatisfactory notions upon comets, and indeed [illegible] method of dealing with almost any subject which involved investigation, are so many points which render the extravagant praises of Fontenelle and Lalande altogether inadmissible. His reputation, in fact, was altogether of a different species from that which it ought to have been. So far as that sort of notoriety is concerned with which the public in general is most struck, Cassini and William Herschel appear to resemble each other. Nevertheless, take from the latter Uranus and six satellites, with two of Saturn, and there is left a first-rate reputation among astronomers; withdraw the similar discoveries of Cassini and he remains a commendable and even a remarkable observer, but by no means in his present rank. And it must be remarked that there is throughout Cassini's writings a continual tendency, either from ignorance or vanity, to appropriate the discoveries of predecessors or contemporaries. He speaks of himself as the first who observed the variation of the moon's diameter depending upon her altitude. 'Oui,' says Delambre, in one of his parentheses, 'le premier après Kepler, Auzout, et Hevelius.' The summing up of this searching historian is worth extracting. 'But why, we may ask, has Cassini so universal a reputation? Why has he had more praise to his own share than all astronomers together, at least during their lives? Firstly, because there was in him much to praise, because he was industrious, because he kept public attention constantly awake, because he employed for the most part unusual means, such as his gnomon and his long telescopes; and because, being invited to France as a man who could not be done without, the world early became accustomed to consider him superior to those who had wished him to join them. He was a conquest for which the monarch was praised, and all the éloges bestowed upon him went indirectly to the king. He attributed (faisait hommage) all his discoveries to Louis XIV: he was the favourite astronomer of the court, so that it did not need as much as he had to secure him more reputation than any other. All the world understood Cassini's discoveries; Jupiter turned in 9h. 56m., Venus in 23h. 20m., Mars in 24h. 40m., Saturn had four moons, which no one had seen till then, and a medal had been struck to commemorate the latter. In reality, these phenomena were isolated novelties, infinitely curious things, which all astronomers are very glad to know, but which could have been omitted without any result in the smallest degree prejudicial to the progress of real astronomy. If we feel authorized to reproach any one it is not Cassini, but his contemporaries.' On the other hand Lalande, an astronomer of real merit but of great want of judgment, has the following absurd exaggeration: 'Cassini was one of those rare men who seem formed by nature to give a new face to the sciences; astronomy, augmented and perfected in all its parts by the discoveries of Cassini, underwent in his hands a most astonishing revolution. This great man was the chief glory of the glory of Louis XIV. in this respect, and the name of Cassini is almost synonymous in France with that of the creator of astronomy.' On which we can only say—may every Lalande find a Delambre!

The writings of Dominic Cassini are numerous, and a complete list may be found in Lalande's 'Bibliographie Astronomique.' It is a presumption, so far as it goes, of the accuracy of the character given by Delambre, that none of these writings are now sought after as containing matter of any lasting value, except only the pure results of observation.

II. James Cassini, son of Dominic, was born at Paris, February 18, 1677, and at seventeen years of age was thought of sufficient promise to be received a member of the Academy of Sciences. He accompanied his father to Italy in 1695, and afterwards travelled in England and Holland where he became acquainted with Newton, Flamsteed, &c. He succeeded his father at the observatory, was maître des comptes, and died April 16, 1756. He was proceeding to his estate of Thury, when the carriage was upset, and he became immediately paralytic.

There is not much of brilliancy in the results of the life of James Cassini as compared with those of his father, whom, on the whole, he much resembled in the character of his methods of observing and d[illegible]ng. He was a better mathematician, and devoted himself for the most part to fundamental points of astronomy, and to the construction of tables. His separate writings are not numerous; some of theses [illegible]ptics by himself and his brother (afterwards killed as before stated) were published in 1691, being nothing but college exercises. The others are, 'De la Grandeur et de la Figure de la Terre:' Paris, 1720; and 'Elémens d' Astronomie:' Paris, 1740.

The first of these two works (a *suite* to the Mem. Acad. Sci. for 1719) contains the account of the continuation of Picard's arc of the meridian, begun by Dominic Cassini and La Hire in 1680, and recommenced by Dominic and James Cassini in 1700. On the results of this measurement Dominic Cassini concluded that the earth was a spheroid elongated towards the poles, contrary both to theory and other observation. Much discussion was excited at the time [GEODESY]. The second work is an elementary treatise, which seems intended to explain his own and his father's astronomy. It is accompanied by a volume of tables, which must be considered as the joint work of the father and son. This collection was republished when the original edition became scarce, but with so many errors of press as to diminish its value materially. The correct edition is that of the Imprimerie Royale, Paris, with the fleur-de-lys in the title page. From this work we see that James Cassini seems biassed, which is no great matter of surprise, in favour of his father, even to the extent of declaring that the hypothesis of the successive propagation of light, which all the world knew to belong to Roemer, was in fact started, examined, and rejected, by Dominic Cassini. He cites the Memoirs of the Academy of Sciences, which when examined by Delambre were found to contain nothing in support of the assertion, but showed very distinctly that Cassini and Roemer were in controversy upon the subject, and that nothing but the rejection of the hypothesis now known by the name of Roemer appears to have belonged to Dominic Cassini. It appears also that James Cassini was rather Copernican in his notions, but not very strongly determined: that he knew nothing, or next to nothing, of the system and writings of Newton (*Principia*, 1687, J. Cassini's *Astronomy*, 1740), which he cites in two places, once to endeavour to explain the acceleration of Jupiter's motion, in another for observations of a comet. He knows nothing of Bradley's discovery of aberration (1727-28), but Delambre has forgotten when he adds that he knew nothing of that of nutation, which was not published till 1747. He appears to be, like his father, a follower of Descartes, and also, like him, to prefer graphical methods to calculation. His ideas upon the theory of comets would have been much the better for the study of Newton. Nevertheless, as an observer, J. Cassini was distinguished. His determinations of the times of revolution of the five satellites of Saturn then known are very exact; he first observed the inclination of the orbit of the fifth (now the seventh) of them. He improved the methods and tables of refraction: determined very nearly the variation of the obliquity of the ecliptic, and the length of the year by comparison of a large number of equinoxes of his own and others. He left also a great number of good observations. Nevertheless, it is but justice to Picard and Roemer to remember, that both of the Cassinis put together, distinguished as they were, did absolutely nothing which can now bring them to the daily remembrance of the astronomer, though their fame has surpassed that of the re-inventor of the micrometer, and the inventor of the transit instrument.

III. Cæsar Francis Cassini, son of James, was born at Paris, June 17, 1714. He is generally known by the name of Cassini de Thury, having been the first to take a territorial appellation from the estate acquired by his father or grandfather. He accompanied his father during his geodesical operations in 1733, and was received member of the academy at the age of 21. He succeeded his father as director of the observatory, and as maître des comptes, and died September 4, 1784, of small pox. His most remarkable labour is the large triangulation of France, published in 1744, under the title of 'La Méridienne, &c., vérifiée, &c.' Paris. He nearly completed the large map of France, of which his son presented 124 sheets to the National Assembly in 1789. He made a long succession of observations at the observatory: but these, though they would have done credit to Dominic Cassini, were too late of their kind. The time was past in which a descendant of the first two Cassinis could compete with the rest of the world by his hereditary means only. We must refer to Lalande's 'Bibliographie' for a list of his writings, and to Delambre (Hist. d'Astron. xviii. Siècle) for detail upon his astronomical observations.

IV. John Dominic Cassini, son of Cassini de Thury, and most commonly known by his title of Count, was born at Paris, June 30, 1748, and is still living. He is the first of his family who decidedly adopted the system of Newton, though the same may perhaps be said of Cassini de Thury, from some isolated passages in his writings. He was elected member of the academy in 1770, in which year he published the account of a voyage made by order of the king, for trial of the chronometers of Le Roy. He was employed in 1787 with Méchain and Legendre, in the operations for the junction of the observatories of Paris and Greenwich by a chain of triangles. He made repeated endeavours to induce the government to re-establish the observatory upon a new footing and with large instruments. The National Convention, apparently with the desire to force him to resign, resolved, in 1793, that the observatory should be placed no longer under the control of one person, but of four, who should take annual duty in rotation. Of the four the Count Cassini was one, and the other three were his own pupils. To this he refused to submit, and resigned his charge September 6, 1793. He received an order to quit the observatory in 24 hours; and in the following year was imprisoned for seven months. From that time he abandoned astronomy entirely, refusing either to take part in the great survey, or to belong to the Bureau des Longitudes, or to the Institute, though he entered the latter body under the empire. He fixed himself on his own estate, and devoted himself to the duties of the *conseil* of his department. His son, the fifth of the name, began an astronomical career in 1798, aged 16, but soon relinquished this pursuit for that of botany. He was a judge of the *cour royale*, and died of the cholera at Paris during the late prevalence of that disorder.

We have thus the history of the occupation of an observatory by the members of one family for 122 years, and in spite of the deserved reputation of all the observers in question for talent and assiduity, it must be asserted that the hereditary system did not succeed. Delambre remarks with some bitterness, that during the whole of the reign of the Cassinis not 'one little catalogue of stars' issued from the national observatory. Picard had proposed the erection of large instruments, and the observation of right ascensions and declinations. To this Dominic Cassini was opposed, and in the usual course of things, such an error would have lasted for his life, and would have been repaired by his successor. But when the first Cassini was followed by a second, and a third, wedded to the ideas of their common ancestor, there could be no improvement; and the consequence is that the observatory of Greenwich, for the same period, bears away the palm from that of Paris in actual use to astronomy. Had the National Convention adopted the sound ideas of Count Cassini the case might have been altered. The errors of his predecessors appeared to be fully known to him, and had he been allowed to rectify them, it is probable that the fifth Cassini would not have abandoned the career of his ancestors, and we might have seen the observatory of Paris, such as it has been since the accession of Napoleon, still in the hands of the distinguished family who had connected their name with all its previous history.

CASSIODO'RUS MAGNUS (or, as some call him, MARCUS) AURELIUS, who lived in the sixth century, was a man of letters, an historian, and a statesman. He composed a history of the Goths in twelve books, which is only extant in the abridgment of Jornandes; and he caused the ecclesiastical histories of Socrates, Sozomen, and Theodoret to be translated into Latin by Epiphanes, under the title of 'Historia Tripartita.' Twelve books of his letters are extant: the first ten consist of instructions relating to the service, and written in the name of Theodoric, and his successors, Amalasontha, Athalaric, Theodatus, and Vitiges; the two last consist of similar papers written in his own name. They extend from the year 509 to 539. He also composed a treatise *De Artibus ac Disciplinis Liberalium Literarum*, upon grammar, rhetoric, logic, arithmetic, music, geometry, and astronomy: a treatise on orthography, an exposition of the psalms, and other religious works. He enjoyed a high reputation among his contemporaries for learning, eloquence, and talent; but his Latin is impure, and his style full of the conceits of the age.

He was born at Scylacium, in the country of the Bruttii, probably about the year 470, though some date his birth ten years later. His father, also named Cassiodorus, was high in office under Odoacer and Theodoric; and he himself was early introduced to public life under the former, and obtained the confidence of the latter, under whom he filled the offices of secretary and quæstor. By Theodoric's successors he was appointed master of the offices and prætorian prefect. Under the reign of Vitiges, about the age of 70, he retired from the world, and founded the monastery of Viviers, in Calabria, where he lived nearly to the age of 100 in devotional retirement, enlivened by the exercise of his mechanical ingenuity in the construction of water-clocks, dials, &c., the collection of a valuable library, and composition. His last work, 'De Orthographia,' he states in the preface to have been written in his 93rd year. The best edition of his works is that of Garet, Rouen, 1679, in 2 vols. fol., reprinted at Venice; which contains the abridgment of Jornandes and the Historia Tripartita, with a life prefixed. There is also a life of Cassiodorus in French, by Sainte-Marthe. Paris, 1690. 12mo. As to the character of Cassiodorus, and the literature of his age, the reader may consult Schlosser, *Universal Historische Uebersicht*, &c. iii. 4

CASSIOPEA (zoology). [Medusa.]

CASSIOPEIA. This constellation is called Cassiepeia (κασσιέπεια) by Aratus, and Cassiopea by Manilius. In the Greek fable, Cassiopeia is the wife of Cepheus and mother of Andromeda, placed in the heavens with her head from the pole, so as to turn round apparently upside down, because (according to Hyginus) she boasted of her own beauty as superior to that of the Nereids. This constellation may be found by looking on the side of the pole opposite to the Great Bear, where will be seen five rather bright stars disposed in something like an M. These stars are also in a line drawn from Capella to the bright star in Cygnus, and about half way between them. The old figure is that of a woman sitting in a chair or throne, with a branch in her hand. The constellation is on the meridian at midnight, about the end of September, and at eight P.M. about the end of November. The remarkable star which appeared in this constellation in 1572 has been noticed in Tycho Brahe, who also affirms that similar stars appeared in 945 and 1264, whence Sir J. Herschel thinks it possible another such appearance may take place in 1872. But the authority for the first appearance is that of a contemporary of Tycho Brahe, from nameless manuscripts, and as comets are recorded in or about both 945 and 1264, these may have been the stars spoken of. See the 'Companion to the Maps of the Stars,' of the Society for the Diffusion of Useful Knowledge.' Baldwin, 1836, p. 86.

The following are the principal stars:—

Character. Bayer.	No. in Catalogue of Flamsteed, Piazzi (), Bradley [], &c.	No. in Catalogue of Astron. Society.
(d)	4	2796
τ	5	2840
β	11	2
λ	14	39
κ	15	41
ζ	17	52
	18	60
	20	65
	24	78
	[illegible]	89
	[illegible]	121
	36	146
	37	147
	45	196
	48	206
	50	209
	(72)	247
	(101)	2807
	[3195]	2868

CASSIQUIARI. [AMAZON, p. 417; BRAZIL, p. 360.]

CASSIS. [ENTOMOSTOMATA.]

CASSITE'RIDES, (Κασσιτερίδες) a group of islands, generally supposed to be the Scilly Islands. They are first mentioned by Herodotus (III. 115), who professes, however, his entire ignorance of them. Strabo (III. 175) observes—'The Cassiterides are ten in number, and lie near to one another, to the north of the port of the Artabri (Cape Finisterre), out in the open sea. One of them is uninhabited, but the rest are occupied by people who wear black clothing coming down to the feet and tied round the chest. They go about with sticks in their hands, and with beards as long as that of a goat. They live mainly on their flocks in nomadic fashion. They have mines of tin and lead, which with skins they give in exchange for earthenware, salt, and copper vessels, to the foreign merchants. In former times, the Phœnicians alone used to make this voyage from Gadeira (Cadiz), and kept it a secret from all the world.—The Romans, after repeated efforts, became acquainted with this navigation. P. Crassus having passed over to the islands, observed that the mines were worked at a very small depth, and that the inhabitants were peaceably disposed,' &c.

The Greek name of the metal 'tin,' which is cassiteros, (κασσίτερος) occurs in the Iliad of Homer, and the name of the islands is obviously derived from the name of the metal. Cassiteros however may not be a genuine Greek word. It is difficult to suppose that Strabo's description applies to any other place than the Scilly Islands, and yet their position is not very accurately given by him.

CA'SSIUS, CAIUS LONGI'NUS, appears in history for the first time as the quæstor of Crassus, in the unfortunate campaign against the Parthians, B.C. 53. He foresaw the consequences of the expedition into Mesopotamia, and warned his general against it, but without effect. He commanded a wing of the Roman army in the battle where they were defeated; and in the retreat from Carrhæ, discovering the treachery of the guides, he took his own course with 500 horse, whom he conducted alone out of that army safely back into Syria. Succeeding to the command of that province, he held out Antioch against the Parthians, inflicted a signal defeat upon their troops retiring from Antigonia, and drove them, for a time, across the Euphrates. Upon the arrival of the proconsul Bibulus, B.C. 51, Cassius returned to Rome, having acquired great credit by his conduct.

A break occurs in his history, until, after the battle of Pharsalia, B.C. 48, when we find him in Pompey's service, commanding a fleet in the Hellespont. There he had the opportunity of ending the war by taking Cæsar prisoner, who fell in his way accompanied by a very few ships; but instead of doing so, by some strange indiscretion or treachery, he obeyed Cæsar's summons to surrender, and passed over to his side. Again we hear no more of him until the conspiracy against the dictator's life, in which he was a principal; and he was chiefly instrumental in drawing M. J. Brutus, whose sister he had married, into the plot. He had shared in Cæsar's favours, having been appointed by him to a prætorship, and to the command of Syria. Of the latter Antony endeavoured to deprive him, and procured a vote of the people to transfer it to Dolabella. Cassius, who had passed into Greece with Brutus, no sooner heard of this than he hastened into Asia, and speedily collected forces, with which he mastered Syria, Phœnicia, and Judæa; and he was on the point of invading Egypt, when letters from Brutus summoned him to return towards Europe, to make head against the triumviri. After conquering and plundering Rhodes (B.C. 42), he joined Brutus at Sardis, and the united army marching through Thrace into Macedonia, encountered Antony and Octavianus in the plain of Philippi. Cassius wished to avoid a battle as long as possible, being aware that the enemy must soon become straitened for provisions. But Brutus was eager to fight, and as the soldiery also began to murmur at what they called the cowardice of their generals, Cassius was obliged to yield. In the battle he commanded the left wing, and was opposed to Antony. Brutus in the right broke the troops of Octavianus, and drove them off the field; but pursuing his advantage too far, he exposed the flank of Cassius, who was then taken at disadvantage by his able antagonist, and compelled to quit the field. Thinking that all was lost, he put an end to his life. On hearing of his death, Brutus honoured him with the appellation of the 'last of the Romans.'

Cassius was esteemed one of the best generals of the age; his private character was good, though his temper was stern, and he professed a warm attachment to the republican cause. He has not escaped the imputation of being influenced by private enmity in his hostility to Cæsar; and the abrupt way in which he abandoned Pompey's cause is calculated to excite suspicions unfavourable to his character. In his philosophical opinions, he belonged to the Epicureans. See Cicero, *Ep. ad Div.* xv. 19.

CASSIVELLAUNUS. [BRITANNIA.]

CASSOWARY. [STRUTHIONIDÆ.]

CASTA'LIA (zoology). [SUBMYTILACEA.]

CASTALIO'N or CHASTEILLO'N, SEBASTIAN, was born in Dauphiné, some say in Savoy, about 1515. He applied early to the antient languages, and became a great proficient in Greek and Hebrew. Being at Strasburg in 1540-1, he made the acquaintance of John Calvin, who invited him to Geneva, and had him appointed to a chair in the college of that city. After two or three years, Castalion having become obnoxious to Calvin on account of some of his opinions, which were not in accordance with Calvinistic orthodoxy, especially on the subject of predestination, left Geneva for Basel, where he employed himself in teaching Greek and in writing several works, chiefly on Scriptural subjects. He wrote 'Psalterium reliquaque sacrarum Literarum Carmina et Precationes, 1547, with notes;' 'Jonas Propheta, heroico carmine Latino descriptus;' 'Dialogorum Sacrorum ad linguam et mores puerorum formandos, libri iv.' This last work has been translated into English by Dr. Bellamy, under the title—'Youth's Scripture Remembrancer, or select sacred Stories by way of familiar Dialogues, in Latin and English, with a short Application of each Story,' London, 1743. He also published a version in Latin verse of the Sibylline books, with notes, and a Latin translation of the Dialogues of Bernardino Ochino. Before he left Geneva, he had undertaken a complete Latin version of the Bible from the Hebrew and Greek, which he completed at Basel, where it was published in 1551, and dedicated to Edward VI. of England. He published a French version of the same in 1555. Castalion's versions were made the subject of much conflicting criticism. His Latin Bible went through several editions; that of Leipzig, 1697, contains also his 'Delineatio Reipublicæ Judaicæ ex Josepho;' 'Defensio versionis Novi Fœderis contra Th. Bezam,' and 'Nota prolixior in cap. ix. Epistolæ ad Romanos.' He carried on an epistolary controversy with Calvin and Beza, who assailed him with many charges, and even urged, though ineffectually, the magistrates of Basel to drive him away. He passed his latter years at Basel in great poverty, and died in 1563, leaving a numerous family in want. He was buried in the cathedral, through the exertions of three Polish gentlemen who had been his pupils. In his latter years he was in the habit of resorting to the banks of the Rhine or of the Birs when swollen, where with a crook he endeavoured to catch the pieces of wood and branches of trees which the river carried along, in order to procure fuel for his family. This was made the subject of a charge by

Calvin, as if he had been guilty of pilfering. In 1562, Castalion published his eloquent 'Defensio suarum Translationum Bibliorum et maxime Novi Fœderis,' in which he speaks of himself and his works with the frank earnestness of an injured person. His 'Dialogi IV. de Prædestinatione, Electione, Libero Arbitrio, ac Fide,' were published in 1578, by Faustus Socinus. He has been abused both by Calvinists and Roman Catholics; Arminian critics have been more indulgent to him. He wrote a treatise to prove that magistrates have no right to punish heretics. (Bayle's *Dict.*, edit. 1730, art. *Castalion.*)

CASTA'NEA, the botanical name of the plants which the English call sweet chestnuts. From the similarity in their name one would be disposed to believe that the genus to which horse-chestnuts belong was nearly related to this; they are, however, extremely different in every thing except the unimportant circumstances of the fruit of both being prickly; and even in regard to this, their resemblance is more apparent than real, for the prickly part of the fruit of Castanea is an involucre, while that of the horse-chestnut is a pericarp; and the so-called seeds of Castanea are seed-vessels, while the parts which in the horse chestnut correspond with these are really seeds. [ÆSCULUS.]

The sweet chestnut, or Spanish chestnut (*Castanea vesca*), is a deciduous tree of considerable size, with long shining serrated sharp-pointed leaves, clusters of long spikes of pale greenish-yellow unisexual minute flowers having no corolla, and fruits consisting of a roundish prickly husk or involucre, technically called a cupula, and analogous to the cup of the acorn or the beard of the filbert, in which are contained one or more dark brown ovate sharp-pointed nuts, each of which conceals a large single seed, and is tipped by the remains of several rigid styles. The seeds contain a large quantity of nutritive starchy matter of a sweet flavour, on which account chestnuts are extensively used as food in the countries where the tree abounds. In all Spain, the southern parts of France, Italy, and the adjacent countries, sweet chestnuts, either raw, or roasted, or ground into flour, or prepared in some other way, form a common article of diet. It is however not the wild Castanea which furnishes the nuts that are principally consumed in the south of Europe, and exclusively exported to more northern countries, but a number of cultivated varieties, the nuts of which are larger, and the seeds sweeter; of these the most remarkable are the *Corive*, the *Ganiaude*, the *Egalade*, and the *Marron cornu* of the south of France. The sweet chestnut is a native of all the southern parts of Europe, extending eastward to the Caucasus, beyond which it hardly passes in Asia. In North America it occurs wild in great abundance in the hilly and mountainous parts of Virginia, the two Carolinas, and Georgia, as well as other districts, not however reaching beyond New Hampshire to the north. Michaux distinguishes the American from the European chestnut as a peculiar species, but hardly upon sufficient grounds. It is always included as a wild plant in our English Floras, but upon no sort of authority. It is said indeed that its timber forms a considerable part of our oldest buildings, and that it has been ascertained to be the material out of which were constructed the antient piles that have from time to time been taken from the Thames, the roof of Westminster Abbey, the church of St. Nicholas at Great Yarmouth, erected in the reign of William Rufus, and the timbers of other places; but these statements have arisen from the singular mistake of confounding the timber of *Quercus sessiliflora* with that of *Castanea vesca*; it is to the former that are to be referred all the supposed cases of antient chestnut wood found in English buildings. [QUERCUS.] The sweet chestnut in its wild state acquires an unusual size: on Ætna, where it constitutes forests, there are trees of great antiquity, one of which is called 'the hundred horse chestnut,' from its being able to contain a hundred mounted men in its hollow, has or had a circumference of above 160 feet: and in the department of the Cher, near Sancerre, there is still standing a tree of this species, which at six feet from the ground measures more than thirty feet in circumference, and is to all appearance still sound. It is stated that 600 years ago this was called the great chestnut tree, and its actual age is computed at 1000 years. The wood of the chestnut is well suited for paling or piles, as it resists well the influence of water; it is also used for mill-timber and for water-works, but it is not in this country of much importance: it is said to produce one of the best kinds of charcoal.

Several varieties are cultivated in this country, among which are a shining-leaved, a variegated, and a cut-leaved sort; they are multiplied by grafting on the common sweet chestnut.

Castanea pumila, or the Chinquapin nut, is a shrub rather than a tree, with leaves hoary on the underside, and small sweet nuts; it is a native of the United States of North America, especially in damp mountainous situations on a gravelly soil.

There are some other species in India and on the west coast of North America; but being unknown in this country they need not be described in this place.

CASTANETS, a musical instrument of percussion, of Moorish origin, composed of two small concave pieces of chestnut wood (hence the name) or of ivory, in the form of cockle shells, united at one end by a string, hung on the forefinger and thumb, and struck together in musical time, while the performer is dancing.

CASTANOSPE'RMUM, a remarkable genus of *leguminous* plants, the only known species of which is described as forming a tree thirty to forty feet high, in the forests near Moreton Bay in New Holland. It has unequally pinnated leaves, with elliptical ovate acuminate entire smooth leaflets. The flowers are papilionaceous and bright saffron-yellow. The pods are large, solitary, and pendulous, produced by the two years old wood, obtuse, rather inflated, and containing from three to five large chestnut-like seeds. The shade afforded by the foliage is said to excel that of most Australian trees. By the natives the seeds are eaten on all occasions; they have when roasted the flavour of a Spanish chestnut, and travellers assert that Europeans who have subsisted upon them have experienced no other unpleasant effect than a slight pain in the bowels, and that only when the seeds are eaten raw. They are however hard, astringent, and not at all better than acorns. (Hooker's *Botanical Miscellany*, vol. i. p. 241: vol. ii. p. 51, 52.) The plants have been introduced to this country by the Horticultural Society, but they will not live out of doors in the winter.

CASTEL, the name of several places in France, most of which are distinguished by some distinctive addition to the name, as Castel Sarrasin, &c.

CASTELLI, BENEDICT, was born at Brescia in 1577, and died at Rome in 1644. He was a Benedictine, and taught mathematics at Pisa, and afterwards at Rome. He is known as having been a defender of the hydrostatical doctrines of Galileo, in his 'Risposta alle opposizione,' &c., Florence, 1615. He also was the first who applied the new doctrines of motion to hydraulics, on which subject he is to be considered as the earliest writer of the experimental school. In his treatise 'Della Misura dell' Acque Correnti,' Rome, 1638, he explains several phenomena, but was misled by a notion that the velocity of issuing water is proportional to the height of the reservoir, instead of the square root of the height. Bernard Castelli, a painter, was born in the same year at Genoa. (Montucla, ii. 201; iii. 679; *Biog. Univ.*) There are some works of his in 'De Motu Aquarum Currentium,' Florence, 1723, and a life published at Dresden in 1746.

CASTE'LLO, CASTE'L, an appellative, which is a component part of the names of many Italian, Portuguese, and Spanish towns. It is derived from the Latin Castellum, a diminutive of Castrum, which meant originally a fort or castle, and this is to this day the meaning of the Italian appellative Castello; but afterwards it was applied to the villages or assemblages of houses which gradually arose round the fort. Many of these villages have become considerable towns, and are surrounded by walls; and though the original castle has disappeared, they still retain the old name of Castello or Castel, joined to some local denomination which particularizes each of them, such as Castel Goffredo, Castelforte, Castelnovo, Castellamonte, &c. The number of towns and villages whose names begin with Castel is very considerable in Italy. The principal are: Castellamare, *i. e.* 'Castle by the sea,' a pleasant well built town on the Bay of Naples, opposite the capital, and near the site of the antient Stabiæ, with various mineral springs, a royal villa, and docks for the navy; population 15,000. There is another Castellamare in Sicily, on the gulf of that name, a small town on the site of the antient port of Segeste, 25 miles S.W. of Palermo. Castel Vetrano is a town of 12,000 inhabitants, in the province of Trapani, 6 miles N. of the ruins of the antient Selinus. Castel Gandolfo, in the papal state, is a pleasant village on the banks of the Alban lake, with the country residence of the popes, and near it the remains of the villa of Domitian. [ALBA LONGA.]

In Tuscany is Castel Fiorentino, a thriving town of 3000 inhabitants, in the Val d'Elsa, 16 miles S.W. of Florence. In the duchy of Parma are Castel San Giovanni and Castel Guelfo. In the Sardinian states are Castelnuovo di Scrivia, near Tortona, with 5000 inhabitants; Castellamonte, in the province of Ivrea, 4000; Castellazzo, in the province of Alessandria, 5000. In the island of Sardinia is Castel Sardo, a seaport, N. of Sassari. There are also several towns in Italy called Castiglione or Castellone, which is an augmentative of Castello, such as Castiglion Fiorentino, a town of 5500 inhabitants in the Val di Chiana, in the province of Arezzo, and Castiglione, in Lombardy, in the province of Mantua, near which a great battle was fought between the French and the Austrians, in August, 1796. [BONAPARTE and AUGEREAU.] There are also in Tuscany several places called Castiglioncello, *i. e.* 'little castle.'

In Spain, names of towns beginning with Castell are chiefly found in the eastern provinces, where the Limousin and Catalonian, which are dialects of the Romance language, are spoken. There are several in Catalonia, such as Castellfollit, Castello di Ampurias, &c. In Valencia is Castello della Plana, 50 miles N. of Valencia, near the sea. In Portugal are several others, the principal of which is Castello Bianco, or 'white castle,' a considerable town built on a hill in the middle of a large and fertile plain in the S. part of the province of Beyra. It is a bishop's see and the head town of the Comarca or administrative province of the same name, which includes 97 parishes. [BEYRA.] There are also Castel Rodrigo, a fortress in the N. part of Beyra, not far from Almeida; Castel de Vide, in the Alentejo, near the frontiers of Spain, &c.

CASTELNAU, the name of several towns and villages in France, of which the most considerable will be noticed under their respective departments. This nat[illegible]ems [illegible]culiar to the south of France.

CASTELNAUDARY, a town in France, the chief place of an arrondissement in the department of Aude. It is on the bank of the little river Fresquel, a feeder of the Aude and the great canal of Languedoc passes through it: it is 472 miles from Paris by the road through Orleans, Limoges and Toulouse.

There seems to have been a town on the site of Castelnaudary in the Roman times, Sostomagus, mentioned in the 'Itinerarium à Burdigala Hierusalem usque.' This town is said to have been destroyed when the Visigoths settled in this part of France: the same people are stated some time after to have rebuilt it and fortified it. From them, as being Arians, Malte Brun derives its name, Castrum Novum Arianorum, whence, by corruption, Castelnaudari. Expilly, who writes the name with two r's, Castelnaudarry, gives for its etymology Castrum Novum Arrii. At a subsequent period it became the capital of the Lauraquais or Lauragais, a district so called from it's original capital, Laurac, now an insignificant town. In the wars carried on against the Albigenses, Castelnaudary suffered severely, and again in the wars between the English and French. But the event which has made the place best known in history was the victory gained A.D. 1632 by Maréchal Schomberg, at the head of the troops of Louis XIII., over the malcontents headed by the duke of Montmorenci. The battle itself was little more than a skirmish brought on by the rashness and signalized by the valour of the duke, but it was rendered decisive by his being wounded and taken prisoner. He was afterwards executed for treason at Toulouse. The field of battle, on the banks of the Fresquel, just below the city, and the house to which the wounded duke was taken, are still regarded as objects of interest.

The town stands on an eminence, and contains some well-built houses, but most of them have the roof projecting far beyond the body of the house, which defaces the outward appearance, and renders the interior dark and sombre. From the *hôtel de ville* (town-hall) there is a beautiful prospect. The church is well built, and contains a painting which is highly esteemed, by Rivals, an artist born near Toulouse: the subject is the Scourging of Christ.

The population of Castelnaudary in 1832 was 8471 for the town, or [illegible] for the whole commune. The inhabitants are engaged in the spinning of wool, the machinery for which purpose is moved by water. The trade of the town is promoted by a [illegible] formed by the canal of Languedoc. The borders of [illegible] shaded with trees, furnish an agreeable promen[illegible] [illegible]ief trade is in corn: woad, which was formerly [illegible] is now scarcely, if at all, attended to. The town contains a high school and an agricultural society, and several charitable institutions. Among the natives of Castelnaudari may be mentioned Germain La Faille, the historian of Toulouse, and General Andréossy.

The arrondissement of Castelnaudary had, in 1832, a population of 52,659.

CASTES. [HINDUS.]

CA'STI, GIOVAN BATISTA, was born in 1721 in the Roman State. He studied in the seminary of Montefiascone, and afterwards took priest's orders. Little is known of his early life, until 1762, when he published 'I Tré Giuli,' a series of 200 sonnets on the subject of a debt, amounting to three giuli or paoli, a Roman coin worth about five pence, which the author describes himself as having incurred. His merciless creditor insisted upon immediate payment, which the poet endeavours to put off by all sorts of ingenious devices, by flattery, entreaties, threats, &c. A rich vein of humour and facetiousness runs throughout the whole composition. The 'Tré Giuli' have been translated into English, London, 1826. In 1765, Casti went to Florence, where by his wit, as well as by his real information, he found favour with the Grand Duke Leopold and his court. When Joseph II. visited Florence in 1769, he became acquainted with Casti, and invited him to Vienna, where the poet was well received; and he afterwards attended Prince Kaunitz, the prime minister, in several diplomatic missions. In 1778 he went to Russia, where he was introduced to Catherine II., and where he conceived the plan of his 'Poema Tartaro,' which contains a satire on that empress and her court under fictitious names. He afterwards returned to Vienna, where he obtained the situation of Poeta Cesareo, or court-poet, vacant by the death of Metastasio in 1782. He there composed some burlesque dramas, among others 'Il Re Teodoro a Venezia,' which was set to music by the great composer Paisiello; and 'La Grotta di Trofonio,' which is a sort of satire upon philosophers. He wrote another opera buffa, in which he parodied the story of Catiline's conspiracy, and Cicero's part in that transaction. It is said to be extremely humourous, but we do not find it among his printed works. About the time that the French entered Italy in 1796, Casti left Vienna for Milan, where he showed himself a warm partisan of republicanism. He lived afterwards some time at Florence; and lastly, in 1798, he visited Paris, where he remained till his death in February, 1803. At Paris he published in 1802 his 'Animali Parlanti,' a poem, which is his chief title to fame. It has been called a satire on courts, but it might be styled as well a satire on political society in general, for the author lashes demagogues as well as courtiers. It has been partly translated and partly imitated by W. Stewart Rose in his 'Court and Parliament of Beasts,' London, 1819. Casti had much of the humour peculiar to Berni's school [BERNI], of which he may be considered as one of the last specimens, although he rose higher in the choice of his subjects, and in the freedom of his allusions. A complete edition of his 'Novelle Galanti' was published in 3 vols., 8vo., Paris, 1804. They are humorous stories in verse, and the subjects are much after the fashion of Boccaccio's tales, written in a fluent style, but mostly licentious. Casti by this work placed himself among the very few indecent Italian writers of the eighteenth century.

CASTIGLIO'NE BALDASSA'RRE, was born of a noble family in the State of Mantua in 1478. He studied at Milan under Merula and Demetrius Calchondylas, and afterwards returning to Mantua he entered the service of the Duke Francesco Gonzaga, whom he accompanied in his campaign in South Italy, when Gonzaga led the French army to the conquest of Naples. After the defeat of the French by Gonzalo of Cordova in 1503, Castiglione repaired to Rome, where he attached himself to the court of Guidobaldo di Montefeltro, Duke of Urbino, who was a patron of literature. During his residence at Urbino, he enjoyed the company of Bembo, Bibbiena, Giuliano de' Medici, and other distinguished men who graced that little court. In 1506 he was sent by the duke to England on a mission to Henry VIII., who was pleased with him and made him a knight. After Duke Guidobaldo's death, he followed his successor Giuseppe Maria della Rovere in the campaign against the Venetians. When Leo X. ascended the Papal throne in 1513, [illegible]iglione was sent as ambassador to him. Some years afterwards [illegible]s recalled to Mantua by his natural sovereign the Duke [illegible] employed by him on several missions, and after some years was sent again to Rome to Pope Clement VII., who took him into his own service and appointed him his ambassador to Charles V. While Castiglione was residing at Madrid in this capacity, the news came of the taking and sacking of Rome by the Imperial army in 1527. This unexpected catastrophe affected the mind and the health of Castiglione, who became disgusted with courts and politics. Charles V., who valued him, offered him the bishopric of Avila, which he refused. After lingering in Spain another year, he died at Toledo, in February, 1529.

The principal work of Castiglione is his treatise in the form of a dialogue 'Del Cortigiano,'—Of the Courtier. He wrote it while he was at the court of Urbino, which happened to be then a very favourable specimen of courts. Castiglione specifies all the qualities which an accomplished and intelligent and at the same time honest courtier ought to possess, and the manner in which he ought to use them for the good of his prince. The 'Cortigiano' has been much and long admired in Italy, both for the thoughts and the style, and it still ranks among the classical works of the sixteenth century. Castiglione wrote also poetry, both Latin and Italian: his 'Lettere,' or correspondence, were published by Serassi, in 1769, 2 vols., 4to., with a Biography of the Author.

CASTILLA is the name of one of the two kingdoms by the union of which the present Spanish monarchy was formed; and it is also the name of one of the great territorial divisions of present Spain. The name appears to be derived from 'Castellum,' a castle, in Spanish 'Castillo;' and the arms of Castile exhibit several towers or castles in their shield. The kingdom of Castile was originally one of the several Christian kingdoms formed in Spain as the Christian population which had taken refuge in Asturias, advanced gradually S. of their mountains, and gained ground in the interior over the Moors. Castile had first its counts, who were dependent on the kingdom of Leon; but in the eleventh century it became a separate kingdom, which by degrees extended over the greater part of Spain, embracing, besides the provinces which are still called Castile, the original kingdom of Leon and Asturias, Galicia, Estremadura, and lastly, Andalusia, after the final expulsion of the Moors. The kingdom of ARAGON embraced the rest or E. part of Spain. The two crowns became united by the marriage of Isabella, Queen of Castile, with Ferdinand, King of Aragon, A.D. 1471. After Ferdinand's death, 1516, Charles I. (V. of Germany) inherited both crowns, which have remained united ever since, although in the official and administrative language they have continued to be styled as separate crowns, each having its respective laws, usages, and prerogatives. For the antient constitution of Castile, see CHARLES V. Of late years the administration, both political and judicial, has assumed a more uniform system over all Spain, the whole country being divided into intendencies or provinces, without regard to the boundaries of Castile and Aragon.

By the territorial division of Spain, which was in force from the time of Charles V. till the beginning of the present century, two of the largest provinces of the kingdom were [illegible] by the names of Old Castile, or Castilla la Vieja, and New Castile, Castilla la Nueva. They included together the most central part of Spain. We shall describe both under this head, specifying the provinces or intendencies into which they are now subdivided for the purposes of administration.

Castilla la Vieja is bounded N. by the Bay of Biscay, E. by the Basque provinces, Navarre, and Aragon, S. and S.E. by Castilla la Nueva, and W. by Leon. It extends about 260 miles N.E. and S.W. from Santander to the neighbourhood of Talavera la Reyna. Its breadth is very irregular; at its widest part, about the latitude of Burgos, it is about 110 miles: in other parts it varies from 60 to 70, and in some it is hardly 20. The principal river of Castilla la Vieja is the Duero, which rises in the mountains called Moncayo, 5000 feet high, one of the most elevated parts of central Spain. A ridge, under the names of Montes de Oca, Moncayo, &c., runs N.W. and S.E. through the provinces of Burgos and Soria, and parallel to the course of the upper Ebro, dividing the waters which run into that river from those which flow westwards into the Duero. From the Moncayo an offset detaches itself in a S.W. direction, running by Medina Celi, [illegible]guenza, Paredes, Ayllon, Buytrago, Somosierra, San Ilde[illegible]so, and the Escurial, where it assumes the name of Sierra de Guadarama. It then continues [illegible] called Sierra de Avila, until it joins the lofty Sierra de Gredos on the borders of Estremadura. This long [illegible] ridge divides the waters of the Duero from those of the Tagus, and forms at the same time in several places the boundary between Castilla la Vieja and New Castile. The greater part of Castilla la Vieja lies N. of this ridge, and between it and the Asturian mountains to the N., forming a wide basin, watered by the Duero and the Pisuerga, and other affluents of the Duero, and sloping to the W., where it opens into the plains of Leon. North of the mountains of Reynosa, which form part of the Asturian chain, lies the province of Santander, which is detached from the rest of Old Castile, although included in it as forming one of its administrative subdivisions. The district of Rioja, belonging also to Old Castile, lies E. of the Sierra de Oca, and is, geographically speaking, a part of the basin of the Ebro. Old Castile has many elevated plains, such as that of Avila, which is above 3400 feet high [AVILA]; and the high grounds E. of Burgos, and in the district of Soria, at the foot of the mountains of Oca and Moncayo, where the climate is cold, and the soil not very productive. The valleys enjoy a milder climate, and produce corn and wine. The country abounds in cattle and sheep; the latter are partly migratory, or merinos, and partly stationary. There are manufactories of woollens at Burgos and Segovia, of cottons and linens at Avila and Soria, and glass manufactories at San Ildefonso.

Old Castile is divided into five intendencies or provinces: Avila, Segovia, Soria, Burgos, and Santander. The principal towns are—BURGOS, an archbishop's see, with a number of churches and convents, and 12,000 inhabitants; Segovia, the antient Segubia, which has a fine Roman aqueduct in good preservation, the alcazar or residence of the former Moorish kings, a fine cathedral, a military college, several manufactories of fine woollens, and 13,000 inhabitants; AVILA, 5000: Santander, one of the principal ports of N. Spain, with considerable trade, and 19,000 inhabitants; San Ildefonso, already mentioned, with its glass-works, a royal palace and gardens, and 4000 inhabitants. L'Escurial is another splendid royal residence, which is described under its proper head. The whole of Old Castile contains a population of 1,053,000, according to Miñano, exclusive of the clergy, military, students, vagrants, beggars, &c., whose numbers are not ascertained.

Old Castile and Leon are considered as the cradle of the Spanish monarchy. The people of Old Castile retain much of the old Castilian character for steadiness, sobriety, perseverance, and trustworthiness, united with a considerable degree of reserve, haughtiness, and taciturnity.

Castilla la Nueva is bounded to the N. by Castilla la Vieja, to the E. by Aragon and Valencia, to the S. by Murcia and Andalusia, and to the W. by Estremadura. It is [illegible]00 miles from N. to S., and 2[illegible]0 from E. to W. The two principal rivers are the Tajo and the Guadiana, both of which run westwards. The Tajo has its source in the W. side of the Sierra de Molina, a continuation of the Moncayo above mentioned, and which runs southwards along the border between Castile and Aragon, and then across the province of Cuença, which is one of the most elevated in Spain, dividing the waters of the Guadalaviar and other rivers that flow through Valencia into the Mediterranean, from those which flow westwards into the Tajo and Guadiana. Offsets of this ridge enter Valencia and run in a S.E. direction to the coast of the Mediterranean. Between the southernmost end of this ridge, which Spanish geographers call Iberian, near Chinchilla on the borders of Murcia, and the Sierra de Alcaraz, which is the E. beginning of the Sierra Morena or Marianic range, is a plain in which stands the town of Albacete, and which separates the two ranges which many have supposed to be united. (Miñaño, *Diccionario Geografico*, art. 'España.') Through this gap the Xucar, which has its sources in the province of Cuença in New Castile, passes on its way to the Mediterranean. On the N.W. slope of the Sierra de Alcaraz are the sources of various streams, which by their union form the Guadiana. The Guadiana crosses the province of La Mancha from E. to W., and then turning to the southward enters Estremadura. The waters that fall into the Guadiana from the N. are divided from those which flow into the Tagus by the ridge called Montañas de Toledo, which rise S.W. of the great central plain of Castile, in which Madrid is situated. The Montañas de Toledo join to the W. the Sierra de Guada-

[illegible] which runs into Estremadura. The mountains of the interior of Spain form large irregular groups, separated by extensive elevated plains; and it is not so much the mountains as the general inclination of the plains, which determines the course of the rivers. Thus the Guadarmena and several other rivers which rise in Cuença and La Mancha N. of the Sierra Morena, flow into the Guadalquivir, which runs S. of the same Sierra, and their sources are separated by the high lands of La Mancha, from the waters which run N.W. into the Guadiana.

The large mesas or plains of New Castile are chiefly sown with corn, and being entirely destitute of trees, for which the Castilians have a singular aversion, and very deficient in running water, they look desolate and burnt up, especially in summer. There are few villages in the plains. The hills, especially in La Mancha, are planted with vines, and produce some very good wine, such as the wine of Val de Peñas, which is mostly used at Madrid. Large flocks of sheep are reared in New Castile. In the province of Cuença are iron mines and iron works. In La Mancha are rich mines of quicksilver [ALMADEN]. There are manufactories of arms at Toledo; of soap, paper, and linens, in Cuença; of woollens at Guadalaxara; of silks at Talavera, besides the manufactories established in the capital [MADRID].

New Castile is divided into five intendencies: Madrid, Toledo, Guadalaxara, Cuença, and La Mancha. The principal towns are Madrid, TOLEDO, ARANJUEZ, ALCALA DE HENARES; Guadalaxara, the chief town of the intendency of the same name, which has some good buildings, an antient Roman bridge, woollen manufactories, and 7000 inhabitants; Cuença, which is a bishop's see, has 9000 inhabitants; Ciudad Real, the chief town of La Mancha, with 8000 inhabitants, is known for its fairs and its excellent mules. The whole population of New Castile, including Madrid, is 1,602,000, according to Miñano, with the same exception as before, concerning the clergy, &c.

The principal high roads 'caminos reales' of Spain branching out from Madrid cross Castile in different directions. That from Madrid to Burgos by Aranda de Duero, crosses the Somosierra ridge on the borders between Old and New Castile. From Burgos the road continues by Vittoria and Irun to France. This line of road is kept in good repair. Another very good road leads from Burgos to Santander, which is the shipping port for the surplus corn of Old Castile and Leon. The high road from Madrid to Estremadura and Lisbon leads by Talavera to Badajoz. The great southern road leads by Ocaña and through La Mancha, and by the pass of Despeña Perros into Andalusia. The great eastern road from Madrid to Valencia passes also through La Mancha to Albacete and Almanza in Murcia. The other or more direct road to Valencia through the mountains of Cuença is in bad repair. Two roads lead from Madrid to Zaragoza, one by Siguenza and Medina Celi, and the other by Molina and Daroca.

The canal of Castile was undertaken to facilitate the communication of the great corn plain of the Duero, both in Leon and Castilla la Vieja, with Reynosa at the foot of the Asturian mountains, from whence the corn is carried on mules or carts to Santander. It passes by Valladolid, Palencia, and Aguilar del Campos, and a branch of it extends to Burgos. The undertaking, however, is not yet complete. Want of communications is one of the principal drawbacks upon the industry and productiveness of the two Castiles. (Miñano, *Diccionario Geografico estadistico de España*; Antillon, *Geografia de España*; Laborde, *Itineraire descriptif de l' Espagne.*)

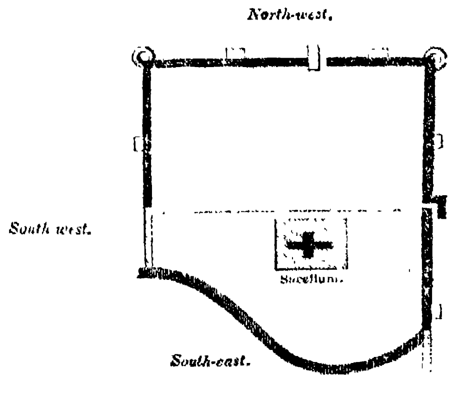
CASTILLON, a small town in France, in the department of Gironde. It is on the right or north bank of the Dordogne, and on the road between Bergerac and Bordeaux. It derives its only claim to notice from its historical interest. When Guienne, long in the possession of the English monarchs, was conquered by the French, a number the nobility of the province formed a plot for recalling English, and Talbot, the most famous of the English ptains of his day, was sent with a force of 4000 men to stain the revolted lords. Bordeaux opened its gates to n: he made himself master of Castillon and Fronsac, recovered all Guienne. The approach of the French es changed the face of affairs. Castillon was invested them, and Talbot, strengthened by some reinforcements m England, left Bordeaux, where he then was, to march its relief. He attacked the French camp, which was strongly fortified; but all the efforts of the hero, who was then upwards of 80 years of age, were unavailing. His army was defeated, himself and his son fell in the action, Castillon surrendered, and Guienne was re-united to the domains of the French crown. The battle of Castillon was fought A.D. 1453. The population of this town, in 1832, was 2528; that of the whole commune, 2897. There are several other places of the same name in France.

CASTING. [FOUNDING.]

CASTLE, from the Latin *castellum*, a diminutive of *castrum*, an encampment, is a walled inclosure with a tower or towers, strongly constructed and intended as a place of safety. Numerous castles, for the most part in ruins, still remain in various parts of Great Britain, France, Germany, Italy, and in the East; but our remarks are principally confined to those of this country. The castles of England consist of those erected by the Romans; of British and Saxon castles erected previous to, and Norman castles erected after, the Norman conquest; and also of the more modern stone and brick castles, erected from about the reign of Edward I. to the time of Henry VII. The Roman castles in this country are numerous, and some of them still in very perfect condition, such as Burgh Castle and Richborough. The Saxons most probably adapted the Roman inclosures to their modes of defence, and it appears that they often raised a mound on one side of the walls on which they erected a keep or citadel.

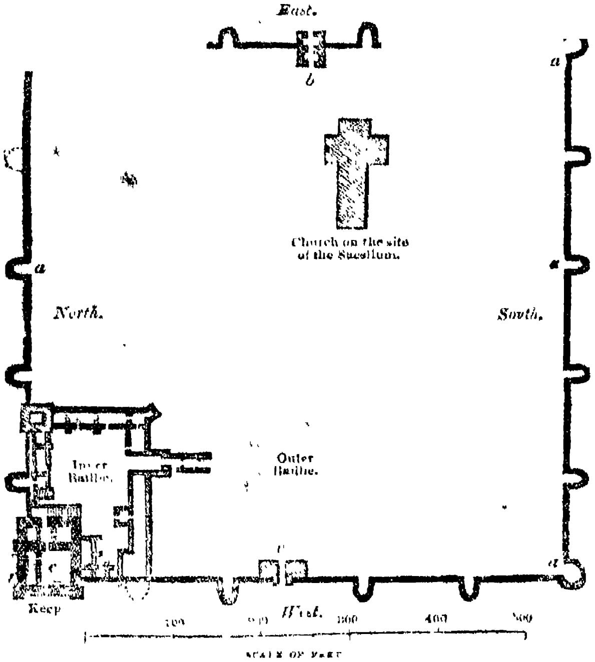
In various parts of England, Scotland, Ireland, and Wales, there are numerous encampments or castles, mostly occupying the summits of hills, which have been ascribed to the aboriginal inhabitants. Among the most remarkable are the Herefordshire Beacon, on the Malvern Hills, in Worcestershire; the Caer-Caradock, near Church Stretton, in Shropshire; Moel Arthur, in Flintshire; Chun Castle, in Cornwall; and Maiden Castle, in Dorsetshire. (Britton's *Arch. Dict.*)

Roman Castra were probably sometimes formed on the sites of British works. Richborough Castle, in Kent, perhaps the earliest Roman castle constructed in this island, has been conjectured to have been formed in the reign of Claudius, and completed by Severus. (Batteley's *Antiq. Rutupinæ*, pp. 6, 14, &c.) It still retains the leading features of one of the most perfect of the stationary castles built by the Romans in England. The basement of the Sacellum, or small temple for depositing the ensigns, forms an important feature in this castle; and in the walls are the traces of the four gates. The entrance through the north-east wall is by one of the two gates (*c*) called by the Romans the Porta Principalis, and which became in aftertimes the postern gate. (King's *Munimenta Antiqua*, vol. ii., p. 10.) The Prætorian gate is supposed to have been on the side of the slope towards the æstuary, which formerly bounded this side of the castle. The second principal gate was opposite the first principal gate or postern; and the Decuman gate and the Prætorian are presumed to have been nearly opposite. The form of this castle, like Burgh, is nearly a rectangular parallelogram, with rows of bricks placed at intervals in the walls in a horizontal posi-



[Plan of Richborough Castle, Kent.]

tion. These layers of bricks formed a fresh foundation for every succeeding layer.



[Plan of Porchester Castle, Hants.]

Porchester Castle, another Roman station (Stow's *Annals*, p. 12) of a rectangular form, with hollow circular towers (*a*) at the angles and sides, presents examples of both Saxon and Norman adaptations and castle-building within its walls. The Roman gates (*b*, *c*) most probably the Decuman and Prætorian, have been fitted up with gates constructed after the Norman style of fortifying castellated entrances. The area of Porchester is 620 feet by 610. At the north-west angle a square Saxon keep (*e*), 57 feet by 58, has usurped the place of one of the circular Roman towers. To this tower Mr. King supposes an addition to have been made by the Normans, who at the same time fortified it after their manner, forming an inner baillie or ballium within the outer baillie formed by the larger Roman inclosure. This keep may be considered the citadel of the castle, and was the residence of the chief officer. The keep [illegible] and Norman castles was to these people what the prætorium was to the Romans: and where the sacellum of the Romans was most probably situated a Christian church was often erected, as at Porchester, where a Norman church still remains close to the Prætorian gate in high preservation. At Caistor, in Norfolk, the church is on the site of what was probably the antient temple. The keep at Porchester stands like most of the early Saxon keeps, adjoining to and [illegible] upon the very outward wall of the castle area itself, unlike the Norman keep towers, which were usually in the clear open space of the castle area, as at Hedingham, in Essex, or unattached to the walls as at Rochester. The *Themelii* (θεμέλιοι, layers of brick) are seen in parts of the Roman walls, which, like all the walls of Roman castra, are of rubble; while the Saxon and Norman works are usually faced with squared stones. The Norman gates were secured with a portcullis, a practice which it appears the Saxons did not adopt: there is no sign of a portcullis having been used in the Saxon keep at Porchester. At Nicopolis, near Alexandria, in Egypt, there is a Roman castle very similar in plan to the castle at Porchester previous to the Saxon and Norman alterations. (King's *Munimenta Antiqua*, pl. xxviii., vol. ii.) Pevensey Castle in Sussex is considered to have been a late Roman work, if not an Anglo Roman building. The *Themelii* are not laid horizontally as at Richborough and Burgh, but more like the Saxon herring-bone. Like Porchester, it has had many subsequent additions in later times. The earlier works are far more durable than the later constructions.

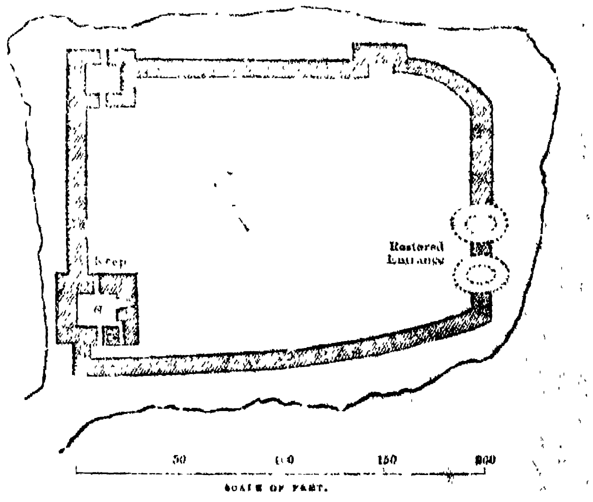
[illegible] plan is an irregular curve with solid towers, and a curved inner ballium with hollow towers, and a keep. The design given in King's 'Munimenta' is however very incorrect, having nearly the form of a circle, while the real shape approaches to that of a triangle with the ends round. The walls at Pevensey average ten feet in thickness, and twenty feet in height.

King, in his 'Munimenta Antiqua,' gives some plans and views of castles which he thinks may have been constructed after the plan of Syrian castles, to which he argues they bear, in many parts of their plan, a strong resemblance. Launceston, Brunless, and others are mentioned by King as being of Phœnician origin, a position which it is much easier to assert than to prove. Conisborough, another singular castle, is considered by the same author to be an early British work.

Saxon castle-building was probably borrowed from the Romanized Britons, who had acquired a taste and knowledge of the arts from the Romans. Thus in Pevensey there are works that have an appearance of Roman character and design, and yet are so much ruder in execution than any other Roman works, that they can only be referred to a time when the knowledge of the Roman arts, though yet fresh in the memory of the inhabitants, might probably be on the decline.

British, Saxon, and Norman castles have one principal feature, the keep-tower, which is a strong and massive building, placed either near the side of one of the external walls, or attached to them. As a general rule, Saxon castles have the keep-tower attached to the walls, and the Norman unattached; but there are exceptions in both cases, though we believe not many.

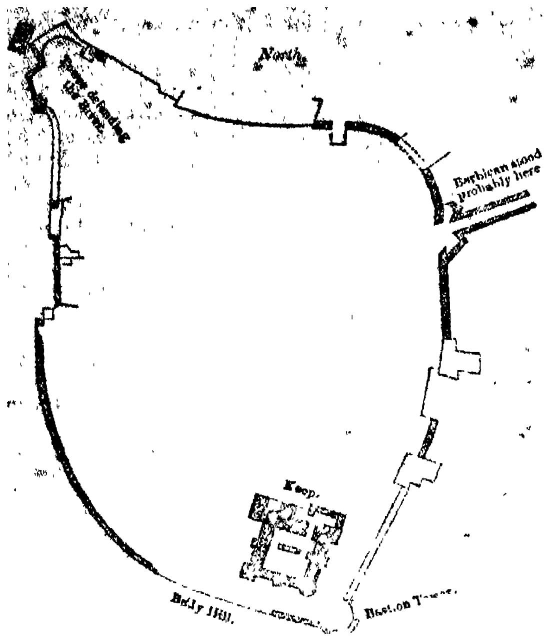
Among many others, King considers Castleton, in Derbyshire, to be a genuine Saxon castle, from the style of its architecture and the appearance of herring-bone masonry in the walls.



[Plan of Castleton Castle, Derbyshire.]

The keep (*a*) is attached to the walls of the castle, which is also fortified with one small square tower and another half tower. The castle-keeps at Guilford and Colchester castles have some curious herring bone construction in brick, which is considered to be a distinguishing mark of Saxon building. Goodrich castle-keep, which is also Saxon, is placed in a manner somewhat similar to those at Porchester and Pevensey; but the castle itself is Norman, and has four circular towers at the angles.

Norman castles, as fortifications, are the strongest. They consisted of mounds and ditches, or moats, with walls on the mounds surmounted with battlements: the walls were also fortified at the top with small projecting towers called bastions. In the walls were entrance gate towers, with bridges either of stone or wood, which were made to draw up and down. The entrances were also guarded with thick doors and portcullises or gates, which dropped down through grooves at the side of the masonry. All apertures, except the gateway, were usually very small. Platforms were made behind the parapets. The gateway was sometimes defended by a barbican, and also flanked by towers, as well as the outer walls. The keep was usually in or near the centre of the castle, and it had sometimes a chapel within it. Rochester castle, which stands on a small eminence near the bridge over the Medway, is a fine example of a Norman castle. It was probably rebuilt by the Normans, soon after the conquest, on the site of a more antient castle,



[Rochester Castle, and Keep.]

and presents a fine example of a Norman keep, 'which originally consisted of four floors, including the basement or dungeon story. It is about 70 feet square at the base, with walls varying from 13 to 8 feet in thickness, and rising to the height of 105 feet to the top of one of the angular turrets. The walls of the ground floor slope or bend inwards; but from that to the top they are continued perpendicularly. Externally there is a pilaster buttress near the centre of each side, and at three angles are square staircase turrets, and a rounded turret at the fourth angle. At the north face is a projecting work, forming a sort of vestibule to the chief entrance door-way to the first floor, and this is approached by a flight of steps commencing at the western side, and returning round the corner. The walls, doors, and windows are constructed to repel assailants.

'The first ascent was by a flight of 12 or 13 steps, leading round the north-west angle to an arched door-way, beneath which a flight of seven steps led forward to a drawbridge that connected with the arched gateway to the entrance-tower: this opened into the vestibule, between which and the keep there were no other avenues of communication than by a third arched passage in the thickness of the wall. This latter inlet to the body of the keep was defended by a massive door and portcullis, the hinges and grooves of which remain; and in the roof are openings for the purpose of showering missiles on the heads of assailants.'

The interior of the keep is divided longitudinally by a strong wall into nearly equal parts, which communicate by open arches on each floor. In the centre of this wall is a well of considerable depth, 2 feet 9 inches in diameter, neatly wrought, open to the very top of the keep, and communicating with every story. There were three stout floors besides the basement. 'The basement story was low and gloomy; here the munition and stores for the use of the garrison were deposited. In the north-east angle is a circular winding staircase, communicating from the ground to the summit, and within the south wall is a square passage, or funnel, which also communicates with the upper floors, and from its singularity has given rise to much fanciful speculation; among other conjectures, it has been considered to have been used for the conveyance of stores to the upper part of the keep.' On the north side is a flight of steps leading to a dungeon.

'The first floor, which seems to have been that occupied by the soldiery, and into which was an entrance from without, was 22 feet in height. Besides 7 large loop-holes, larger than those beneath, there were two spacious conical fireplaces, the flues of which gradually contracted to the outer part of the walls, where there were small apertures for the smoke. Another, but smaller fireplace is contained in a little apartment within the north-west angle, and here also were two very curiously-contrived and well-defended windows, designed to command a view of what was passing on the steps of entrance. Within the east floor of this wall is a gallery, together with some private apartments, the openings into which were well calculated to secure those who might be there stationed to watch a besieging army. In the south-east angle is a second circular staircase, which, as well as that in the opposite tower, opens to the top of the building.'

'The second floor consisted of the state apartments, 28 feet in height, and was more ornamented and lofty than either of the others. These communicated by four large semicircular arches, formed in the partition wall, which was sustained by massive columns and half columns. Within the thickness of the wall round the upper part of this floor is a gallery which traverses the whole keep, and receives light from without through 25 small windows: the exteriors of these were more highly finished than any of the lower openings, and inwardly they appear to have been secured by wooden shutters, the hinges and bare holes of which still remain. This gallery was also open to the state-apartments by six arches on each side.' The upper floor was about sixteen feet high, and has likewise a gallery, with openings both within and without, similar to the preceding. From the remains of a large arch in the south-east corner it seems highly probable that the chapel was placed here.

The roof of the keep, as well as the floors, have been destroyed: the former, most probably, consisted of a platform on a level with the top of the wall within the parapet: the latter was about five feet high, and had embrasures about two feet wide. The four towers at the angles were raised another story, and had also small platforms with parapets and embrasures. The gutters which conveyed the water from the platform still remain.

The outward walls, which formed an irregular parallelogram of about 300 feet in length, were strengthened by several square and round towers embrasured and provided with loopholes and machicolations. On the north-east was the principal entrance, which was defended by a tower gateway with outworks at the sides. (Britton's *Architectural Antiquities*, vol. iii.)

Lincoln castle, also a Norman castle of the first class, was founded about 1068, at the same time with the castles at Hastings, Nottingham, and York. The keep stands on the south side of the castle. The plan is an irregular polygon. The character of this keep resembles Arundel, Tunbridge, and other Norman castles, and is set on an artificial mount, like Clifford's tower at York, the keep at Windsor, and others. The interior of the castle contains six acres and a half.

In Grose's 'Antiquities' (vol. i. preface, p. 10,) there is an interesting restoration of a Norman castle with the keep in the centre, and surrounded by the inner and outer baillie, showing also a Saxon mount. But we are informed that there is no good authority for this restoration of Dunnington castle. Bedford castle, which was taken by Henry III., 1221, is considered to have been somewhat similarly surrounded, from the fact of its having been taken in four attacks: first the barbican, then the outer baillie, then the inner baillie, and finally by mining the tower the besieged capitulated. Nevertheless it is not by any means clear that the form was such as is restored by Grose.

According to Asser's statement, Alfred built castles of wood and stone. Elfrida, his daughter, built eight castles in three years. (Henry of Huntingdon's *Hist.* p. 204.) William of Malmesbury describes a stone castle built by Athelstan at Exeter, A.D. [illegible]14. William the Conqueror was a great builder of castles. (Ib. *Hist.* p. 8.) Forty-nine castles are mentioned in Domesday Book, which notices Arundel as the only one named in the time of the Confessor. It is said that in the 19 years of Stephen's reign 1115 castles were erected. It is almost unnecessary to remark that the building of such strong edifices, which in the then state of warfare were often impregnable, is a proof of the insecurity to life and property which prevailed. Every feudal chieftain had his stronghold, round which his immediate retainers rallied for the purpose of mutual defence, or to annoy and plunder their neighbours. A very considerable number of old towns of Europe gradually arose around these baronial fortifications, and it is interesting to trace, in the history of many of these communities, the progress by which the town, originally a miserable dependence on the castle, gradually obtained privileges, and charters, and wealth; and increased in strength and importance exactly in proportion as the owner of the fortress lost both; till finally the castle, from being neglected and deserted, was either levelled with the ground and furnished materials for house-building, or remained in ruins, an enduring monument of the slow but certain victory of the once subject townsmen over their lords.

We may conclude this article with a brief notice of a few of the remarkable castles still remaining.

Chun Castle, Cornwall, most probably an early British castle, is circular in its form. The plan consists of two concentric circles, raised on a slight artificial mound. Launceston Castle, probably of the same date, has a circular keep or citadel, surrounded by an outer circular wall, both placed on the summit of a conical rock. Fortifications of a later date have been formed at the base of the hill, with works connecting these with the earlier circular works on the summit of the rock. There are some curious castles in the north of Scotland, called Duns. Picts Castle, in Shetland, is a good example. They appear to have been conical, and to have had galleries in the walls.

Oxford Castle seems to have been a Saxon or Norman keep, erected within an earlier circular enclosure, like Chun Castle. Conisborough keep is circular, but it has six enormous buttresses, which give it an angular appearance. The general plan of the castle at Old Sarum, near Salisbury, resembles Chun and Launceston.

Hedingham Castle, Essex, has a fine Norman keep of four stories, part of which is in good preservation. The entrance is over a drawbridge, and the access must have been extremely difficult to besiegers. Richmond Castle, Yorkshire, has also a fine Norman keep-tower. Kenilworth Castle, which encloses an area of seven acres, is built on an irregular plan; but the keep, like that of most Norman castles, seems to have been nearly in the centre of the enclosure. Of the later brick castles, among the most interesting are Tattershall, Hurstmonceaux, Thornbury, and Caistor. Tattershall, in Lincolnshire, erected about 1455, is a large square brick tower, with polygonal turrets at the angles. Hurstmonceaux, in Sussex, is a brick castle, also with polygonal turrets at the angles and sides, and is similar in the arrangement of the plan of the external wall to the castle at Porchester. The entrance gate-way forms the keep; it was built in the reign of Henry VI. Thornbury Castle, perhaps the last erected, was begun in 1540.

Caistor, in Norfolk, was erected about 1450, and is remarkable for two very large circular brick towers, at the northern angle, one of which only remains. Beaumaris, Conway, Caernarvon, and Caerphilly Castles, all of great extent, are fine specimens of the style of castellated architecture of the time of Edward I. Of the numerous castles erected at various times in this island, a few are still used as residences. The finest are Windsor Castle, the residence of the king, and Warwick Castle, the residence of the Earl of Warwick; and it will be difficult to find in all Europe any edifices of this class which can be compared with them for magnificence. Berkeley Castle, Gloucestershire, Alnwick, Northumberland, Leeds Castle, Kent, Arundel, Sussex, and some others, are still used as dwelling-houses.

Convenience and magnificence are united in the castles of Harewood and Spofford, in Yorkshire. Naworth, in Cumberland, has equal merits. Corfe Castle, which was strong and of great extent, was defended as late as the reign of Charles I.: it is now in ruins. Dover Castle, also of great extent, presents specimens of the architecture of every period of castellated building.

Few parts of Europe contain so many ruins of castles as the banks of the Rhine. They are almost all built on an irregular plan, and adapted to the nature of the rugged sites on which they are placed. The most remarkable both for their size and history are the castles of Ehrenbreitstein and Heidelberg

There are many ruins of fine castles in Normandy and in the Pays des Vosges. Switzerland has also its castles, but they are on a smaller scale. The French castles were often bastilles, like Villebon, the castle of the Duke de Sully.

For general information on castles, the reader may consult King's 'Munimenta Antiqua;' and also the drawings and prints of castles in the king's library of the British Museum. We are indebted to Mr. Britton for permission to consult the numerous drawings of castles (plans and views) which he possesses. Grose's 'Antiquities;' Coney's 'Warwick Castle;' 'The Military Antiquities of the Romans in Britain,' by the late William Roy; and Britton's 'Architectural Antiquities,' are our chief authorities.

For further information on castles the reader is referred to Dallaway's account of castles in his 'Discourse on Architecture in England;' 'Antient Castles of England and Wales', engraved by W. Woolnoth, with descriptions, by E. W. Brayley, jun.; and notices of castles in the 'Archæologia,' and 'Gentleman's Magazine.'

CASTLE-MARTYR, a village of 830 inhabitants, in the barony of Imokilly and county of Cork in Ireland, formerly returned two members to the Irish parliament, for which Richard Earl of Shannon received 15,000*l.* compensation at the union. The village, which is a borough and has a charter-school, is the property of Lord Shannon, who has a fine demesne of 1200 Irish acres adjoining. (*Repts. of Commissioners.*)

CASTLEBAR, the assize-town of the county of Mayo in Ireland, in the barony of Carragh, 146 English miles W.N.W. from Dublin. Castlebar is situated on the river Clydagh which, rising in the little lake of Castlebar, within a mile and a half of Clew Bay on the W., flows N.E. with the Moy, which it meets in Loch Callen, to Loch Conn, an inland lake in the centre of the barony of Tirawley, and thence runs northward to Killala bay by Ballina.

Castlebar as a town is of very recent date. It is stated in the Report of the Commissioners on Bogs in Ireland (1814), that eighty years before that time there was but one cultivated field of about eight acres between Castlebar and the sea; and that forty years before that time the roads to the west of Ireland did not pass the town of Castlebar at all. The castle, which gives its name to the place, was a stronghold of the De Burghos. In the wars of the rebellion of 1641 it was held by Sir Henry Bingham for the Parliament, when, being besieged by Lord Mayo and his son Sir Theobald Burke, on the part of the Irish Catholics, he surrendered on terms of being conveyed with his troops in safety to the next garrison town. Lord Mayo protected his prisoners during three days, but on their arrival at the bridge of Shrule, beyond Ballinrobe, the fury of the insurgents could no longer be restrained, and Bingham, with all his company, was barbarously massacred. After the old lord's death his son Sir Theobald, then Lord Mayo, was tried for the offence by a special commission appointed for that purpose, 17th December, 1652, and being found guilty was shot by their sentence 15th January, 1653. Castlebar was also a scene of conflict towards the end of the rebellion of 1798, when General Humbert, having landed at Killala with a force of not more than 1000 French infantry, reinforced by about an equal number of undisciplined peasants of the country, put to rout 6000 British troops commanded by Generals Lake and Hutchinson, and that so completely that the action has since been generally known as 'the races of Castlebar.' The town hereupon fell into the hands of the insurgents, by whom it was occupied for about a fortnight, till the surrender of Humbert at Ballinamuck (8th Sept., 1798) put an end to the ill-judged expedition, and with it terminated the last of the Irish rebellions.

Castlebar is a borough-town, though the corporation has for some time been defunct, and, prior to the union, returned two members to the Irish Parliament, for the loss of which franchise Richard Earl Lucan received 15,000*l.* compensation. The assistant barrister for the county of Mayo sits twice a year at Castlebar for the trial of civil bills, and petty sessions are held in the town every Saturday by the resident county magistrates. The county gaol is situated within the borough limits, which comprise the town and a space of about a mile round in every direction.

Castlebar has some trade in linens, but the vicinity of Westport, which at a distance of eight miles has the advantages of being a seaport town and the residence of an enterprising proprietor, operates considerably to its disadvantage. The court-house is a mean building, and the charter-school has been converted into a lunatic asylum. Here is a good foot barrack, a new church, a Roman Catholic chapel, a Wesleyan meeting-house, and a county infirmary. Lord Lucan is the chief proprietor. Castlebar is not lighted or watched, and the streets are repaired by county presentments. There are three bridges over the Clydagh. In 1831 the town contained 909 houses, was occupied by 1196 families, of which 34 were chiefly employed in agriculture, 515 were engaged in trade, manufactures and handicraft, and 647 not included in either denomination: in all a population of 2987 males and 3386 females, total 6373; comprising capitalists, bankers, and other educated men, 92 persons. The population in 1821 was 5404, the increase in ten years being 969 or one-seventh. In 1824 Castlebar contained two Protestant and nine Roman Catholic schools, educating 520 males and 225 females; and by Second Report of Commissioners of Public Instruction in Ireland it appears that in 1834 there were in the benefice of Aglish or Castlebar (total population of the three parishes comprised therein 24,404) 14 schools, educating 1000 males and 626 females. Three of these schools were in connection with the National Board of Education, one in connection with the Ladies' London Hibernian Society, and the great majority situated in and near the town of Castlebar.

(Carte's *Ormond*; Inglis's *Ireland in* 1834; *Parliamentary Reports and Papers*; Barrington's *Rise and Fall of the Irish Nation.*)

CASTLETON. [CASTLE.]

CA'STNIA, a genus of lepidopterous insects. [SPHINGIDÆ.]

CASTOR (zoology). [BEAVER.]

CASTOR, or *α* Geminorum, one of the bright stars in the head of the twins from which the constellation gets its name, being the nearer of the two to the pole. [GEMINI.] This is a remarkable double star, that is to say, consists of two stars so close together as to be inseparable to the naked eye, which are nearly equal, and compose the appearance of the third magnitude. The two are, however, easily separated by a moderately good telescope, being more than four seconds distant from each other at present. Sir J. Herschel has determined the elements of the orbit in which each star moves round the other. (*Mem. R. Astron. Soc.*, v. p. 196.) He calls the star 'the largest and finest of all the double stars in our hemisphere, and that whose unequivocal angular motion first impressed on my father's mind a full conviction of the reality of his long-cherished views on the subject of the binary stars.' By observations of Bradley and Pound, Maskelyne, W. Herschel, Professor Struve, his own, and Sir J. South, he has deduced the following elements of the elliptic orbit of each star round the other; major semiaxis, 8″·086; eccentricity, ·7582; inclination of the real orbit to the apparent orbit on the sphere of the heavens, 70° 3′; period of revolution, 253 years; next period of closest approach, A.D. 1855. In the following years the distances were or will be as follows; at the beginning of

A.D.	Dist.	A.D.	Dist.	A.D.	Dist.
1833	4″·82	1845	3″·85	1851	1″·36
1836	4 ·65	1848	3 ·37	1855	0 ·93
1839	4 ·37	1850	2 ·91	1856	0 ·68
1842	4 ·19	1852	2 ·18		

The whole of the computations are of [illegible] approximations as the present state of the subject will allow.

This star seems on the point of undergoing, within the ensuing twenty-four years, a similar remarkable change to that of which γ Virginis has already furnished a striking instance during the last century, and passing from a distant double star of the second class to a close one of the first, and ultimately to one of extreme closeness and difficulty, such as only the very finest telescopes, with all the improvements we may expect in them, will be capable of showing otherwise than single.'

CASTOR FIBER (Linn.), the Beaver. Into a cavity situated at the posterior part of the trunk, both in the male and female animal, the urinary organs and anus open, and in this are also lodged two pear-shaped bags, which receive the secretion of certain glands, which is termed castor. The bags are united by a ligament supposed to be their excretory duct. The secretion is at first in a liquid state about the consistence of syrup, but it ultimately becomes solid, losing some of its odour and activity. As met with in commerce it is of two kinds, the Russian, and Canadian or English, of which the Russian is the rarest and most esteemed: it is more carefully managed from the time of its excision, being first dried in smoke, and often wrapped in swine's bladder. The bags of Russian castor are in pairs of unequal size, from 3 to 4 inches long, and 1½ to 2 inches broad towards the base, the skin thick, smooth, of a brownish red or yellow, the mass more or less friable or tenacious according to age; adhering to them are in general the remains of the oil or fat-bags. The odour is peculiar, very penetrating, and unpleasant; the taste is also peculiar, bitterish, somewhat acrid or aromatic, and enduring. The bags of American castor are smaller, narrower at the base, of a great variety of colours, yellow or orange-brown or brownish-black, the skin thinner, more of the consistence of paper, the surface often wrinkled, and in general no vestiges of the oil-bags present. Both kinds are occasionally slit open and a part of their contents abstracted. A seam on the surface and an internal cavity, sometimes filled with other materials, indicate when this fraud has been effected.

Castor should be kept in a cool place, in a well-corked bottle.

Brandes, from 1000 parts of Canadian castor, obtained:—

Volatile oil	10·0
Castorine pure . . .	7·0
Castorine with carbonate, urate, and benzoate of lime	3·5
Castoreum-resinoid . . .	120·0
Castoreum-resinoid with benzoate and urate of lime	16·0
Castoreum-resinoid obtained by æther .	1·0
Castoreum-resinoid from watery extract	1·5
Albumen with trace of phosphate of lime	0·5
Osmazome-like matter . .	2·0
Phosphate of lime . . .	14·0
Carbonate of lime . . .	336·0
Carbonate of magnesia . .	4·0
Sulphate of potassa, sulphate and phosphate of lime	2·0
Animal mucus . . .	23·0
Carbonate of ammonia . .	8·2
Animal matter . . .	23·0
Skin and salts . . .	192·0
Loss and moisture . . .	229·1

Castorine may be obtained by boiling one part of castor in six of alcohol, and leaving the filtered liquid to cool, when it falls to the bottom. It is very combustible, and is neither acid nor alkaline; it has a copperish taste. It crystallizes in long diaphanous fasciculated prisms, is insoluble in cold water and cold alcohol, but dissolves in 100 parts of boiling alcohol, also in the volatile oils. Bizio considers it the active principle of castor, but it is more probable that the active properties depend upon the essential oil and resinoid principle: the most proper menstruum to take up these is alcohol or the æthers. Rectified spirit is preferable to proof spirit to form the tincture. The compound tincture of the Edinburgh Pharmacopœia is a valuable form of exhibition. It should never be prepared as an extract or a decoction. The powder is not an objectionable form, if too high a temperature be not employed to dry and render it friable.

If from five to ten grains of castor be received into the stomach, a gentle heat is felt in that organ; a more considerable dose causes a still greater sense of heat, and increased strength and frequency of pulse. That the principles of castor pass into the blood is proved by the secretions acquiring its odour during the employment of it internally. It appears to act specially on the cerebro-spinal and ganglionic systems of nerves, so as to modify their condition. Hence it is used against spasmodic symptoms, and to restore the healthy action of the nervous system when that is disturbed. It is rarely given to excite the digestive organs, the heart, or the lungs, but chiefly to influence the brain, the spinal chord, and the uterus. Its employment is sometimes followed by very profound sleep, which, if the dose be moderate, need not excite alarm. Castor is most useful in hysteria, hypochondriasis, nervous palpitations of the heart, convulsive hiccup, colic, and similar diseases. It ought not to be employed if any morbid sensibility of the stomach or enlargement of the heart exist.

CASTOR OIL. [CROTON.]

CASTRES, a town in France, in the department of Tarn, on the river Agout. It is 365 miles from Paris, in a straight line nearly due S.; in 43° 36′ N. lat., and 2° 15′ E. long. In the middle ages this town was remarkable only for an abbey, the heads of which were the lords of the place. It subsequently became (according to some authorities) a possession of the crown, and having been erected into a lordship in favour of the counts of Vendôme, passed from them by marriage to the counts of Armagnac. Upon the death of the last count of Armagnac, it was seized by Louis XI., after which, with one interval, it remained in the possession of the town. In 1567 Castres was taken and pillaged by the Huguenots, who destroyed the cathedral. It became one of the strongholds of the reformed party, to which the inhabitants were attached; but it was reduced to submission in the reign of Louis XIII., and the fortifications demolished.

The town is situated on both banks of the river, and has two stone bridges. The office of the subprefect, formerly the episcopal palace, is a magnificent edifice; and the town, according to Expilly (1762), has a number of good public buildings and private houses.

The population of Castres, in 1832, was 12,032 for the town, or 16,418 for the whole commune. The inhabitants are engaged in a variety of manufactures; linens, woollens, cottons, paper, leather, and copper and brass goods. It is the most commercial and populous place in the department.

In 1316 Castres was made an episcopal town by Pope John XXII.; the diocese was formed of a portion of that of Alby, and included Upper Languedoc; it was abolished at the Revolution, and the town is now included, with the rest of the department, in the archiepiscopal diocese of Alby.

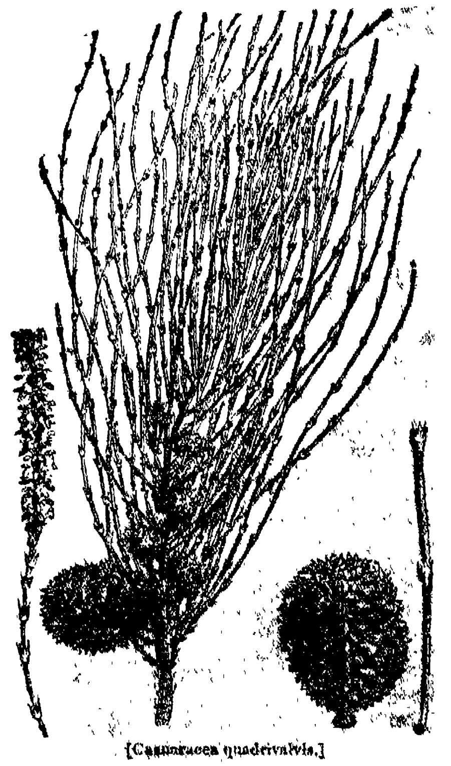
Among the natives of this town may be mentioned Rapin de Thoyras, author of a well-known History of England, and Abel Boyer, also well known by his French and English Dictionary; these were both Protestant refugees; Dacier, an eminent classic; and the Abbé Sabater.

In the neighbourhood of Castres is a remarkable curiosity, *le rocher tremblant*, or the rocking stone: it is of an irregular figure, somewhat approaching to that of a flattened egg standing on its smaller end. Its greatest girth, which is at about two-thirds of its height from the ground, is twenty-seven or twenty-eight English feet; the smallest, which is at the base, is about thirteen; the height is about twelve feet; and the weight is estimated at 600 quintals of 100 lbs. each. The base is convex in the direction of its longer diameter, so that at each extremity of that diameter it rises eight inches from the supporting rock: along the smaller diameter of the base the stone is supported throughout, so that it is only in one direction that it is susceptible of motion. It requires several smart pushes to put this stone in motion, but when the movement has once commenced, a small force suffices to keep it up. *Le rocher tremblant* is near the corner of the rock which serves for its support, and overhangs it; it is on the top of a hill, at the [illegible] of which is a remarkable grotto that once served as [illegible] retreat to St. Dominick. The arrondissement of Castres had, in 1832, a population of 131,134.

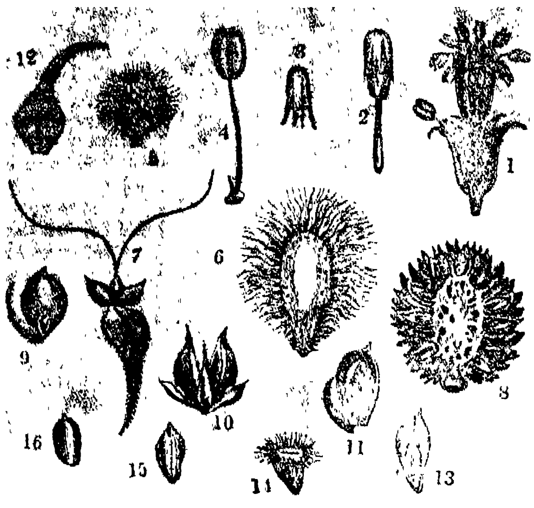
CASTRU'CCIO CASTRACA'NI was born [illegible] about the year 1283. His family name was In[illegible]elli, but he assumed that of Castracani on his adoption into the family of that name, which was one of the principal [illegible] Lucca. When he was 20 years of age he visited England, where some of the Interminelli, who had been exiled from Lucca as Guibelines, had settled, and had acquired wealth by trade. Castruccio was admitted into the court of Edward I., and served in the armies of that prince, but having killed in a quarrel a nobleman of the court, he was obliged to leave England for Flanders where he served under Philip le Bel, king of France, and greatly distinguished himself by his valour and abilities. About 1313 he returned to Italy, and joined the Guibelines of Pisa, whom he assisted in expelling the Guelphs from Lucca. But Uguccione della Faggiuola, the leader of the Pisans and a soldier of fortune, having made himself tyrant of both Pisa and Lucca, threw Castruccio into prison. In 1316 an insurrection of both Pisa and Lucca drove away Uguccione, and the citizens of Lucca, having liberated Castruccio from prison, proclaimed him chief of their republic. He was young, handsome, and brave, clever and unscrupulous, and he strengthened himself in his place by removing, by fair or foul means, all those who were ill disposed towards him.

He then attacked Florence, which was the stronghold of the Guelph party in Italy. He took Pistoja and completely defeated, at Alto Pascio, the Florentine army under Raymund of Cardona, a Catalonian mercenary chief, in September, 1325. He then joined the other Guibeline leaders in inviting the Emperor Louis of Bavaria to march into Italy and complete the subjugation of the Guelphs. The emperor came, and Castruccio became his chief adviser. In 1327 Louis reduced Pisa, and then proceeded with Castruccio to Rome, which he entered by force, and was crowned in the Vatican by the bishops of Venice and Aleria in January, 1328, notwithstanding the excommunications of the pope John XXII. The emperor next assembled a council in which the pope was declared to have forfeited his dignity, and a new pope was proclaimed under the name of Nicholas V. Castruccio, on this occasion, was made Count Palatine. He had already been acknowledged by the emperor as Duke of Lucca, Pistoja, Volterra, and Lunigiana. He aimed at uniting all Tuscany under his sway, and establishing at the same time the supremacy of the emperor over all Italy, according to the principles of the Guibeline party. While at Rome he received intelligence that the Florentines had surprised Pistoja, upon which he immediately returned to Tuscany, and on his way made himself master of Pisa, and besieged and took Pistoja, notwithstanding all the efforts of the Florentines to relieve the place. His exertions during the siege brought on an illness of which he died, 3rd September, 1328, at 45 years of age. His death relieved Florence of one of its most dangerous enemies, and gave at the same time a fatal blow to the Guibeline party in Italy. His children were driven away from Lucca in the following year. Castruccio is acknowledged by Italian historians to have been one of the few Italian chiefs of the middle ages whose ideas soared beyond the narrow circle of municipal ambition, and who entertained enlarged views for consolidating all Italy into one system. His military tactics, the secrecy of his plans, and the quickness of their execution, are also highly extolled. The life of Castruccio by Machiavelli is more a romance than a real biography. Aldo Manuzio the younger has written 'Le Attioni di Castruccio Castracani, Signore di Lucca,' 4to., Roma, 1590, a good work. Tegrimi of Lucca has written the life of Castruccio, Modena, 1496, and Paris, 1546: it is also printed in vol. xi. of Muratori, 'Rerum Ital. Scriptores.' Sismondi, 'Histoire des Républiques Italiennes,' a work however decidedly hostile to the Guibelines in general, may be consulted.

CASUARA'CEÆ, a natural order of incomplete Exogens, whose branches are in all cases long, drooping, green, and wiry, with very small scale-like sheaths, in the room of leaves. The flowers are unisexual, and disposed in verticillate spikes; they have neither calyx nor corolla, are monandrous, and their ovaries are lenticular, with a solitary erect ovule. The fruit consists of hardened bracts, enclosing the small fruits, which are winged. Botanists say that this very small family, which is exclusively Asiatic, Australasian, and Polynesian, is most nearly allied to Myricaceæ; but it appears probable that its immediate allies are either still to discover, or are extinct. In habit and in their striated stems casuaraceæ are so like arborescent equisetums, that one can hardly resist the conviction that there must be some connection between those plants, although botanists hardly recognize it. The timber of some species forms the beef-wood of the New South Wales colonists, and is of excellent quality.



[Casuarina quadrivalvis.]



1, male flowers; 2, one of the same; 3, bracte without its
bracts; 5, female flowers; 6, section of the same
tion of the cone; 9, capsule. 10, tl d; 11, secti
12, a bractea; 13, seed; 14, section
lope; 16, embryo.

CASUISTRY, the name of a science which professes to give rules for the resolution of doubts of conscience. It was greatly cultivated in the 15th and 16th centuries, especially by the Jesuits, and was calculated to be a very efficient instrument of the crafty policy ascribed to that order. The confessor, who professed himself able to lay down exact rules of conduct, to weigh the merits of two conflicting duties, and decide which was the greater of two sins, had the means of obtaining an almost boundless influence over his penitent. The casuists made a distinction between venal and mortal sins. 'It is a fixed rule among the casuists,' says Stillingfleet, 'that an infinite number of venial sins do not amount to one mortal, and consequently, though they have obliquity in them, they do not put a man out of the favour of God.' The science of casuistry, however, though so liable to abuse that it has been termed, not inaptly, the 'art of quibbling with God,' has been cultivated in the reformed as well as the papal church, and for a specimen of its subtleties we may refer to Bishop Taylor's 'Ductor Dubitantium, or Rule of Conscience.' There is a professor of casuistry in the university of Cambridge, whose lectures however have been discontinued. For a full account of the casuists, see Mayer's *Bibliotheca of Casuists*, divided into three heads: Lutheran, Calvinist, and Roman.

CAT. [FELIS.]

CAT-BIRD. [MUSCICAPIDÆ.]

CAT'S EYE, a species of quartz sometimes used as a gem.

CAT'S-TAIL GRASS, the common name of phleum pratense, an agricultural plant, also called Timothy grass. [PHLEUM.]

CATACOMBS, subterraneous excavations, used as vaults for the burial of the dead. They are found in most parts of the world, but chiefly in those countries which, like Italy, Sicily, and Egypt, offer extensive beds of soft *tufo* or of some other stone which is easily cut, and which yet is adhesive enough not to fall in. The probable origin of many of them is that they were mere quarries, where materials were dug for building; and when spacious caverns were thus made, the adaptation of them as places of interment seems natural and obvious.

The catacombs of Rome, the entrance into which is on the Via Appia, at a short distance from the city, are very extensive, and have evidently been used both as burying places and as places of worship, for Christian altars, inscriptions, and paintings have been found, and in part still exist in these gloomy crypts. The generally received opinion is, that during the persecutions the early Christians retired thither to worship in secret, and that the remains of many thousands of martyrs were deposited there apart from the pagan Romans. The long galleries of those catacombs, which twist and turn in a curious manner, are, generally speaking, about eight feet high and five wide; there are mostly three tiers of graves or cells, running lengthwise, one above another, along the galleries, and in some instances there are two and even three of these dark galleries, beneath one another. At certain irregular intervals these subterranean passages converge, and then expand into large vaulted chambers, which still look like churches. Although the cross and the monogram of Christ have long been affixed to every accessible corner, and the traditions of the Romish church give the exclusive occupancy of the catacombs to the Christian dead, there seems good ground to believe that the antient and pagan Romans deposited the [illegible]d in them. According to the ciceroni, or guides, taking in their different ramifications, these cold gloomy galleries run for 20 miles under ground, and several recent travellers have stated their length at six miles, confessing, however, that from their having fallen in and become dangerous in many parts it is not possible to penetrate them to any thing like that extent.

The catacombs of Naples, which are cut in tufo under the hill called Capo di Monte, do not differ materially from those of Rome, and their real extent, which is considerable, is liable to the same exaggeration. The entrance into them is rendered horrible by a vast heap of skulls and bones, the remains of the victims of a plague which desolated Naples in the sixteenth century. Some of these passages are almost covered with Christian symbols, and the paintings in one of the large vaulted chambers or churches, though badly drawn, have retained a wonderful freshness of colouring, considering their under-ground damp situation. The spreading palm-tree is a frequent feature in these pictures. At Palermo and at Syracuse there are similar recesses, the catacombs of the latter place being very considerable, while close in the neighbourhood there are plenty of quarries and subterranean excavations that might have been turned to the same uses. In the island of Malta catacombs, of a much more limited extent, are found at Città Vecchia, cut into the rock on which that old town stands. They occur again in the Greek islands of the Archipelago. At Milo (one of the Cyclades) we have seen a mountain completely honeycombed with them, a labyrinth of tombs running through it in all directions. From the *bassi rilievi*, figures in terra cotta, and other works of art found in them, it was evident that these tombs were of a date far anterior to the Christian epoch. In Egypt these subterraneous excavations occur in all parts of the country where there is rock, but they have neither the extent nor the form of those of Rome or Naples, at least so far as is yet known. Those of Abousir are no doubt very extensive, and have not yet been fully explored. There are extensive excavations near Alexandria, which appear from the style of the ornamental parts to belong to the Greek period.

The anxiety of the Egyptians to preserve from decay the bodies of their friends and the bodies of sacred animals, may sufficiently account for the number of these excavations, and for their being so well tenanted. For an account of these excavations the reader may consult Belzoni, Salt, Legh, Henniker, or any respectable modern traveller in Egypt. In Peru, and in some other parts of South America, both mummies and catacombs have been discovered. The mummies however are frequently buried in the sand, and the size of the catacombs can bear no comparison with the extent of those of Italy and Egypt.

The catacombs at Paris could not be called catacombs with any propriety until very recent times, when, by a decree of the French government, all the churchyards within the city which had been crammed to a loathsome and dangerous degree, were emptied of their contents, and the skulls and bones sent to the spacious subterranean quarries, where they are now arranged in a manner that is grotesquely horrible.

CATALEPSY, or **TRANCE** (from the Greek *κατάληψις*, *catalepsis*, literally 'a seizing'), to which is closely allied *extacy*, or the *extatic trance*, is a disease of the nervous system, attended with an abolition of sensation and of intellectual operation, and with a peculiar condition of the muscles of voluntary motion, those muscles retaining during the paroxysm precisely the same position they were in at the moment of the attack, while the action of the heart and the respiratory functions are but little affected. The malady consists of a great disturbance or an absolute suspension of the functions of the animal life, while the processes of the organic life go on with comparatively little change.

A lively description of a person labouring under a paroxysm of this disease has been given by Dr. Jebb:—'My patient,' says this physician, who is describing the condition of a young lady who was the subject of this curious malady, 'was seized with an attack just as I was announced. At that moment she was employed in netting; she was in the act of passing the needle through the mesh; in that position she became immoveably rigid, exhibiting, in a pleasing form, a figure of deathlike sleep, beyond the power of art to imitate, or the imagination to conceive. Her forehead was serene, her features perfectly composed. The paleness of her colour, and her breathing, which at a distance was scarcely perceptible, operated in rendering the similitude to marble more exact and striking. The position of her fingers, hands, and arms was altered with difficulty, but preserved every form of flexure they acquired: nor were the muscles of the neck exempted from this law, her head maintaining every situation in which the hand could place it, as firmly as her limbs.'

This disease is so rare, while it is not unfrequently feigned, that a suspicion has been excited as to the reality of its existence. Without doubt it is often assumed, and that under circumstances which afford no assignable motive for the deception; but still cases are on record, of which that which has just been recited may be taken as an example, which leave no room to doubt that the affection is not invariably simulated, but is sometimes, though not often, a real disease. The disease, when undoubtedly real, is attended with a disturbed state of almost all the functions of the body. There is commonly severe headache, often giddiness, noise in the ears, lassitude, languor, yawning, a disturbed condition of the gastric and intestinal organs, and, more especially, in the male, of the biliary, and, in the female, of the uterine organs. The functions of the spinal cord and brain are at the same time disordered. The whole muscular system is preternaturally irritable or mobile; there is present a long train of symptoms, commonly termed nervous; the intellectual operations are dull and confused, and the temper is mutable and irascible.

During the paroxysm, which commonly comes on quite suddenly, the patient retains precisely the same posture of the body as at the moment of the attack; even the expression of the countenance which existed at that instant remains unchanged as long as the paroxysm lasts: the eyes, whether open or shut, are perfectly fixed, any position in which any part of the body under the influence of the voluntary muscles may be placed, as the head, the trunk, or the limbs, is retained without the slightest deviation: this fixedness and unchangeableness in the attitude giving to the subject of the malady a striking resemblance to a statue.

The countenance during the paroxysm is almost always paler than natural, though it is stated that it has occasionally been observed to be slightly flushed. The skin in general is unusually cold, excepting about the head, where the heat is sometimes even greater than natural, indicating a preternatural determination of blood to the brain, as well as to all the textures that surround it. The action of the heart is so greatly depressed, that it is often altogether imperceptible, and when capable of being distinguished, it is either slow, occasionally below 50 in the minute, or quick and small. The respiration is sometimes incapable of being distinguished, and is never natural; while the processes of secretion and excretion are performed so languidly as to give little or no indication of their existence; and so, the animal functions being abolished, and the organic being performed in so languid a manner as to be imperceptible, the person is sometimes supposed to be actually dead.

After a period of very uncertain duration, sometimes comprehending only a few minutes, and at other times many hours, occasionally as is stated even days, consciousness returns generally with the same suddenness as the attack commenced, the return to consciousness being accompanied with sighing, and followed by pain or confusion in the head, and a sense of lassitude and fatigue. No memory is retained of anything that may have passed during the paroxysm, the very same train of ideas returning when consciousness is restored as were present at the instant it ceased; and even, according to some narratives, the very same sentences which had been suspended by the seizure being pursued at the moment of recovery.

In the most severe form of the paroxysm, sensation, intel[illegible]ual operation, and voluntary motion are entirely abolished; [illegible] when the attack is less complete, consciousness is re[illegible] Still there is no power of making the slightest movement of any part of the body, nor even of producing so much as an articulate sound; and several striking and even appalling cases of this latter modification of the disease are on record.

The modification of cataleptic disorder which constitutes the affection termed extacy is generally induced by mental excitement, and sustained contemplation of some particular subject, most generally of a religious nature, and more especially when such subjects have raised the passions and engaged the affections. 'The patient suddenly seems mentally struck or carried away from all external objects; either standing or sitting in a most excited and impassioned position, with the eyes fixed and open; and sometimes uttering either the most enthusiastic and fervid expressions, or the most earnest denunciations and warnings, or the most absurd exclamations, with the feeling or belief of their reality; and total abstraction from, or unconsciousness of all surrounding objects or persons.'

Such of the cases as were not feigned which lately made so much noise in London under the idea of inspiration with 'unknown tongues' belong to this affection: the effects produced by the practisers of animal magnetism upon nervous persons are obviously allied to it; and the faculty of improvisation is rarely possessed but under a state of the system perfectly analogous to it, while few who are endowed with this power are in a state of sound health, or consider their faculty otherwise than as a morbid one.

The hypochondriac, the melancholic, and the hysterical temperaments are by much the most predisposed to this disease, while the paroxysm is commonly excited remotely by some disorder of the biliary and digestive organs, or by a suppression or some irregularity of the catamenia; and directly by some powerful mental emotion.

The treatment of the malady must be different in every different case, according to the particular condition of the system and the nature of the exciting cause. If some derangement of the physical health be the primary cause of the disease, as is almost always the case, the indications of which will commonly be found, if looked for, in the disturbed functions of the brain, the stomach, the liver, the uterus, &c., such remedies must be applied as are calculated to restore these diseased organs to a sound condition; and the treatment must be essentially the same if the intellectual or the moral health or both be deranged; for this latter derangement is almost invariably the effect of physical disease, and is wholly dependent upon it. (Copland's *Dictionary of Practical Medicine*; and Southwood Smith's *Philosophy of Health*.)

CATALOGUE (Astronomy). This is the name given to a list of stars with the means of determining their positions annexed, whether latitudes and longitudes, or right ascensions and declinations. Such a catalogue is not only a register of the stars in question, but also gives the means of computing the effects of precession, aberration, and nutation, and thus finding the absolute place of the star in the heavens at any given time. Another species of catalogue is a register only, being a list of objects which are looked at, not for the purposes of geography or navigation, but as connected with purely physical investigations, such as double stars, nebulæ, &c. The places of the objects are only given to such a degree of nearness as will enable the future observer to lay his telescope upon them. We may place in this list all catalogues of comets; and the whole of this second class requires no further description.

Our whole actual knowledge of astronomy, so far as the position of the heavenly bodies is concerned, is contained in the catalogues of stars and the Planetary Tables, the latter of which furnish, not the places of the planets, but the elements by which those places are determined. The names of the principal catalogues will be found in their proper places in the article Astronomy, and there would be no use in repeating them here.

A catalogue, such as is now constructed, shows at one given time the places of a number of stars in right ascension and declination, to which are usually annexed various auxiliary quantities to aid in the reduction of the catalogue to another epoch. These, though useful, are not necessary parts, since they might be supplied by each person for himself, whereas nothing could replace the actual observation made at or near the epoch in question. For the instruments employed in the construction of a catalogue see Transit Instrument, and Circle. The regular work of an observatory, so far as the stars are concerned, is the incessant observation of their places, with a view not only to amend preceding results, and to destroy the necessary errors of one observation by the average of many, but also [illegible] more [illegible] the proper motions of the stars, which have, since accurate catalogues began to be formed, become visible in comparing their results. A catalogue of stars there-fore [illegible] succeeding generations in proportion to its [illegible] comparison of two distant catalogues serves [illegible] the precession of the equinoxes and the proper motions of the stars.

[illegible] of stars are observed by a method which [illegible] correctness depend either upon a plumb-line, [illegible], at the present day, upon a double ob-[illegible]; first, directly; secondly, by means of [illegible] a surface of mercury. The latitude of the place and the refractions of the atmosphere, must also be well [illegible]. The right ascensions of the stars, relatively to each other, depend upon nothing but the correctness [illegible] e instrument employed, and the uniform going of the [illegible] the absolute right ascensions of the stars are measured from a fictitious point, the *mean equinox*. The real equinox is the point at which the sun crosses the equator; but as this point moves in the heavens with a motion nearly uniform, but at the same time affected with slight irregularities [Equinoxes, Equation of], the latter are [illegible] as corrections to be applied when necessary; and catalogues always give the right ascension of the stars as measured from the point at which the equinox would be, if it had its average motion, instead of the real motion. The same fiction is adopted in our measurement of time, which proceeds not according to the real sun, but according to a fictitious body which moves, not in the ecliptic, but in the equator; and not as the real sun moves, but with its average motion. Consequently, the value of the absolute right ascensions of a catalogue depends upon the observer's observations of the sun; these may be wrong, more or less, while his relative right ascensions may be very correct: that is, the differences of his right ascensions may be exact, while all his right ascensions may be wrong by the same quantity, arising from a misplacement of the equinox.

In the mean while, since it is certain that there are stars which are much better known than any others, it is usual to make these, which are called *standard* stars, the sole regulators of the clock, that is, to presume that all the difference of right ascension which appears between the places of these stars as deduced from the catalogue, and that obtained from observation, is the fault of the going of the clock; which, corrected by these observations, is made to determine the right ascensions of stars which are presumed to be not so well known. The tendency of this assumption is, to make the latter species of stars as well known as the former, [illegible] they cannot be by such a method. The observations of the sun, by which even the standard stars must be regulated, are best made at the solstices (from which the equinoxes can be deduced), and of course occur only twice a year. There is in the Nautical Almanac a catalogue of standard stars, a hundred in number, which are reduced and their places given for every ten days throughout the year. This last refinement, namely, the selection and constant observation of a few particular stars, is due to Maskelyne (1790 and 1805); but the celebrated catalogue of Piazzi (1814), though it contains more than 7000 stars, is considered almost as a perfectly standard catalogue.

Looking further back, we find that a preceding epoch begins with Bradley, whose discoveries of aberration and nutation enabled him first to reconcile the discrepancies which his predecessors had detected, but could not account for. Flamsteed (whose catalogue was published in 1725) was the first [illegible] habitually observed with the transit instrument to the extent of forming a large catalogue. Hevelius (1690) was [illegible] who determined right ascensions, not however by the transit instrument, but by the old method of measuring distances of stars from each other. Tycho Brahé, the restorer of astronomical measurement, furnished the first catalogue in which any material improvement was made upon that of Ptolemy: for those of Albategnius and Ulug Beg hardly [illegible] such a description. The catalogue of Ptolemy is [illegible] not formed from observation, [illegible] from that [illegible] of Hipparchus, brought down to the time of the latter by [illegible] (but erroneous) value of the precession. Delambre found, by taking the value of the precession as given by Ptolemy himself, and reducing his catalogue of stars to the time of Hipparchus, that [illegible] presented the state of the heavens more nearly than [illegible] would have done in the time of Ptolemy. [illegible] vol. i. [illegible]

A catalogue [illegible] observations of [illegible] and [illegible] the catalogues [illegible] defective states if they do not agree [illegible] two good observatories, at least [illegible] with each other. To give those who are not [illegible] astronomy some idea of what [illegible] results, we here subjoin the right ascensions of [illegible] as observed and predicted, the last column [illegible] of the catalogue. The hours and minutes [illegible] the same; we give only the seconds and fractions of seconds; that is to say, the star is reported to have passed at a certain time by the sidereal clock, of which the hours and minutes are the same in all three, and the seconds and fractions of a second vary as follows

Day. 1835		Observation at Greenwich.	Cambridge.	Edinburgh.	Prediction of Naut. Alm.
Nov. 1	*n* Piscium	$30^{s},05$	$10^{s},17$	[illegible]	[illegible]
	p Piscium	16,00	16,23	16,05	[illegible]
Nov. 27	τ^{9} Aquarii	53,03	53,09	[illegible]	[illegible]
Nov. 28	*s* Piscium	55,68	[illegible]	[illegible]	[illegible]
Dec. 2	*μ* Ceti	5,04	5,33	[illegible]	[illegible]
	π Arietis	9,09	9,02	[illegible]	[illegible]
	f Tauri	49,64	49,82	[illegible]	[illegible]

We have made no selection, but have taken them as they came. In five instances out of seven, the catalogue lies between the results of the observers.

CATALOGUES. [Bibliography.]

CATALON'IA (CATALUÑA in Spanish), a large province of Spain, the most eastern in the peninsula, and bordering upon France, from which it is divided by the E. Pyrenees. It has the title of principality, and the kings of Spain ever since the time of Charles I. (V. of Germany), have been styled princes of Catalonia. At the breaking up of the western empire, the E. parts of Spain were invaded by the Goths and the Alani, from whose joint names, according to some, the country was called Gothalania, by corruption Catalania, and lastly Catalonia or Cataluña. The Moors occupied Catalonia at the beginning of the eighth century, but Charles Martel, and Charlemagne after him, drove them beyond the Ebro. About the end of the eighth century, we find the first mention of an Earl of Barcelona. The Earls of Barcelona were at first vassals of the Carlovingian emperors, but they afterwards emancipated themselves, and continued to hold the sovereignty of Catalonia and of the county of Roussillon till the middle of the twelfth century, when Ramon Berenguer, the twelfth earl, married Petronila, daughter of Ramiro the Monk, king of Aragon. After the death of Ramon and Petronila, their son, Alonso II. was crowned king of Aragon and earl of Barcelona. Catalonia was annexed to the crown of Aragon as a separate principality, with its own cortes, laws, and usages. By the union of the two crowns of Castile and Aragon in the person of Charles I., Catalonia became a province of the Spanish monarchy, but still retained its laws and privileges, which were however encroached upon by Philip II. and his successors. In 1640 a general insurrection broke out in Catalonia against Philip IV., and the insurgents were assisted by the French, who entered the country. The grounds of complaint which led to the insurrection are forcibly stated in a work published in 1641: 'Noticia universal de Cataluña, en agravios, opresiones, y desprecios, sufrida; en constituciones, privilegios, y libertades, valerosa; en alteraciones, movimientos, y debates, disculpada etc.,' and addressed 'to the Illustrious and Wise Councillors of the Council of One Hundred of the City of Barcelona.' The war of Catalonia continued for many years, during which the Catalonians, growing tired of their French allies, sought to make their peace with king Philip. But the French continued the war on their own account, until, by the peace of the Bidassoa, 1659, Catalonia was restored to Spain, and Roussillon was given up to France. During the war of the Spanish succession, the Catalonians, as well as the Aragonese, took the part of the Archduke Charles of Austria against Philip of France, in consequence of which, Philip having finally triumphed, formally deprived both the Aragonese and Catalonians of their cortes and liberties. By right of conquest. Barcelona however retained in part its municipal privileges.

[Barcelona.] Und[illegible] the present administrative divisions of Spain, Catalonia fo[illegible] [illegible], or intendencia, containing nineteen [illegible] districts, and a populati[illegible] according to [illegible] 000 inhabitants, exclusive [illegible] clergy, military, [illegible] vagrants, &c., whose number [illegible] ascertained. The surface of Catalonia has been, [illegible] Hassel's *Historical and Statistical Almanac* for [illegible], at 572 German square miles, or about 12,[illegible] English square miles. The province has the shape of a triangle of which the sea forms one side, the Pyrenees another, and the frontiers of Aragon, and in a small part those of Valencia the third. The river Noguera de Ribagorza, which flows almost direct S. from the central Pyrenees to the Ebro, divides Catalonia from Aragon; S. of its junction with the Ebro, the latter river continues the demarcation for a few miles, beyond which the territory of Catalonia extends to the S. side of the Ebro, where a ridge called Montsia, which is an offset of the great range of the Teruel and Albaracin mountains in Aragon, enters this southernmost part of Catalonia, and bounds the valley of the lower Ebro on that side. The highest summit of the Montsia, called the M[illegible]acima, is 2740 feet above the sea (Antillon *Geografia de España*). S. of this ridge the small river Cenia divides Catalonia from Valencia. The distance from the mouth of the Cenia direct N. to the frontiers of France near the sources of the Noguera is about 160 miles, which is the greatest length of Catalonia; its greatest breadth from the sources of the latter river to the sea-coast near Rosas is about 125 miles.

The Pyrenees throw out numerous offsets, which run in a general S. direction, dividing the basins of the different rivers, some of which flow into the Ebro, and others into the Mediterranean. The principal rivers are: 1. The Ebro, which comes from Aragon and touches Catalonia below Mequinenza, near which it receives the Segre: it then runs nearly due S. and marks for a few miles the boundary between Aragon and Catalonia; after which, bending to the S.E., it crosses the southernmost part of Catalonia, passes by Tortosa and Amposta, and enters the sea by three mouths forming two islands. The navigation of the Ebro below Amposta is interrupted by shoals and rapids, to avoid which, a canal was begun from Amposta to Alfaques, on the sea-coast, where a good natural harbour exists, but the undertaking has been abandoned. 2. The Seg[illegible], which rises in the Pyrenees near Andorra, runs S.[illegible], passing by Urgel, crosses a plain fertile in corn, then receives the Noguera Pallaresa near Balaguer, and farther S. the Noguera de Ribagorza already mentioned, crosses the fine plain of Lerida, and passing by the town of that name, enters the Ebro below Mequinenza. 3. The Llobregat, which rises near Baga in an offset of the Pyrenees, runs S., receives the Cardener from the N.W., passes through a narrow gorge at the foot of the mountain called Montserrat, and then enters the sea S. of Barcelona. 4. The Ter rises near St. Pau, E. of the Llobregat, runs first S.E. and afterwards due E., passes by Gerona and Torcella, and falls into the Mediterranean near Palamos, where there is a harbour. 5. The Fluvia rises in the Pyrenees near Camprodon, crosses the fertile district called Ampurdan, passes by Olot, and enters the Gulf of Rosas near Ampurias. Besides these, Catalonia is irrigated by numerous other streams, which either fall into the above rivers, or run after a short course into the Mediterranean. The valleys and plains of Catalonia are fertile; but a large proportion of the country is rocky and naturally barren, although the industry of the inhabitants has done much to improve the soil. It does not produce corn enough for its own consumption, and there is also a want of horned cattle; but it produces a considerable amount of wine, which it exports in large quantities. The forests abound with cork trees, which form a considerable article of commerce. At Falset, W. of Tarragona, are mines of lead and antimony. Coal mines have been found in several parts of Catalonia.

The chief wealth of Catalonia is derived from its maritime [illegible] and its manufactories. Catalonia is the most manu[illegible] country of Spain. It has manufactories of wool[illegible]ns, silks, lace, leather, paper, iron, brandy, and [illegible] coasts abound with fish. The Catalonians [illegible]ong the best sailors of the Mediterranean, [illegible] they disputed the ascendency on that [illegible] and Venetians. Of late years their [illegible]uch declined, owing in a great degree [illegible]anish American colonies. The annual value of the exported produce of Ca[illegible]lonia is stated by [illegible] millions of [illegible]...

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The [illegible] towns of [illegible], besides [illegible], are: 1. Tortosa, on the left bank of the Ebro, which is here naviga[illegible] crossed by a bridge [illegible]. Tortosa [illegible] built [illegible], is surrounded by [illegible] towers, is a bishop's see, has some fine buildings and some Roman and Moorish remains, and [illegible] 16,000 inhabitants. The plain around is fertile, and [illegible] numerous wells for the purpose of irrigation. The chief produce is soda. [illegible] neighbourhood of Tortosa are salt pits and [illegible]. 2. Lerida on the Segre, a strong place, with [illegible] 12,000 inhabitants. 3. Tarragona, the [illegible], once the capital of the Roman Tarraconensis [illegible], which included the greater part of Spain, is built on a hill near the sea, about fifty miles S.W. of Barcelona, is an archbishop's see, has a fine cathedral, and several remains of Roman antiquity, such as an amphitheatre, a triumphal arch, and a noble aqueduct, which still carries water to the town. It has some manufactories of silks, carries on a trade by sea, and has 11,000 inhabitants. The country around Tarragona abounds with wine. Tarragona is fortified, and is known in the history of the late Peninsular war for the siege which it sustained against the French Marshal Suchet, and the dreadful massacre of its inhabitants when the place [illegible]
4. N.W. of Tarragona is Reus, a thriving town which [illegible] rapidly risen during the last thirty years. It has manufactories of brandy and liqueurs, and 24,000 inhabitants, who carry on a trade by sea through the small port of Salou, which is six miles from the town. 5. Manresa, N.W. of Barcelona at the confluence of the Llobregat and the Cardener, has manufactures of silks and gunpowder, and 1[illegible] inhabitants. 6. N.W. of Manresa is Cardona on the right bank of the Cardener, and at the foot of a rock of pure salt more than 400 feet high, and nearly three miles in circumference at the base. The salt is shining, white, and transparent. 7. Farther N.W. is Solsona, with considerable manufactories of woollens and hardware. 8. W. of Manresa, and between it and Lerida, is Cervera, with 5000 inhabitants, and a university, which has been transferred here from Barcelona. 9. Mataró, a commercial town on the sea-coast, sixteen miles N.E. of Barcelona, in a country rich in wine, has manufactories of cottons, silks, lace, and glass, and 13,000 inhabitants. 10. Farther N.E. but inland is Ostalrich, a strong place, which commands the road leading from Barcelona into the N. districts of Catalonia. 11. N. of Ostalrich is Gerona, on the right bank of the Ter and at its confluence with the Oña. Gerona is a strong place and has sustained many sieges, is a bishop's see, and has 6000 inhabitants. The territory around is one of the best cultivated in Catalonia: it produces corn, wine, oil, and lemons in abundance. 12. Farther up the Ter is Vich, a bishop's see with manufactories of woollens and cottons, and 12,000 inhabitants. In the neighbourhood are found amethysts, topazes, and coloured crystals, which are carried to Barcelona and worked by the jewellers of that city. 13. N. of Vich is Ripoll, with manufactories of fire-locks and bayonets. 14. Olot, in the valley of the Fluvia, with 14,000 inhabitants, carries on a considerable transit trade. 15. Figueras, a town and fortress near the French frontiers, has 7000 inhabitants. Much local information concerning Catalonia may be derived from Major Vacani's *Storia delle Campagne e degli Assedii degli Italiani in Ispagna, dal* 1808 *al* 1813, 3 vols. 4to, with an atlas, Milan, 1823-5; a work valuable, not only for its military, but also for its historical and geographical details. The Italian troops were employed chiefly in Catalonia.

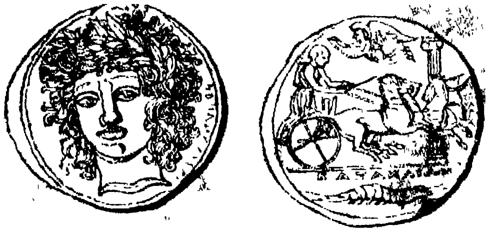
The Catalonians are spirited, industrious, and bold; the educated classes are sociable, well informed, and fond of strangers; the lower orders are boisterous and rude; they are industrious and brave, and make [illegible] guerillas. Their language is a dialect of the Roman[illegible] Langue d'Oc, which was spoken at one time all over the [illegible] of Europe. It differs however from the Valencian, and has become mixed up with Castilian words. The following is a specimen of it, being the title of an old book of custom-house regulations issued by their Cortes: 'Capitols dels [illegible] y altres coses del general del Pr[illegible] Cathalunya y comtats de Rossello (Roussillon) [illegible] en Corts generals del Any 1481 fins en le An[illegible]sive, y dels drets que per prag[illegible] altramente [illegible]. Per manament dels molt Il[illegible] Seyñors Deputats y Oidors de Comptes [illegible]its y comprovats ab sos auctentichs originals recondits [illegible]lo Archiu de la Scrivania major de la Casa de la Deputatio, y estampats ab annotacions y referiments [illegible] Capitols, &c. Antic Roca of Gerona published in the [illegible] century a Catalonian and Latin dictionary.

CATALPA Syringæfolia is a tree of considerable size belonging to the natural order Bignoniaceæ [illegible] formerly included in the genus *Bignonia*, from [illegible] it differs in having only two perfect stamens. When wild, it is found in [illegible] soil in the [illegible] states of North America along the banks of rivers, where it gains a height of 40 to 50 feet with a diameter of 2 or 3 feet. In that state its branches become [illegible] naked, and the beautiful appearance of the [illegible] younger age is lost. The wood is said to be durable. It is of rare occurrence in the gardens of this country, but when it thrives it forms a singularly beautiful tree, hardly exceeding 30 feet in height, and loaded in May and June with immense quantities of large trumpet-shaped white flowers, variegated with yellow and purple. Many such are seen on the west of London, in the villages of Hammersmith, Chiswick, Turnham Green, &c. The leaves usually grow in threes; they have a heart-shaped outline, are downy underneath, and are from 8 to 12 inches in diameter. The pods are from 12 to 15 inches long, tapering, and filled with winged seeds, having a small tuft of hair at their summit. Some of the American botanists have an idea that it is not an actual aboriginal inhabitant of the United States, because it is generally found in the vicinity of habitations, Indian encampments, &c.

CATANIA (the antient *Κατάνη*, Cátane), a city in Sicily, the capital of the Intendenza or province of the same name. The province is bounded to the N. and N.E. by that of Messina, N.W. by that of Palermo, W. by Calatanisetta, S. by Siracusa, and E. by the sea. It is 55 miles in length from S.E. to N.W., and about 35 in its greatest breadth, and has a population of 295,000, distributed in three districts, Catania, Caltagirone, and Nicosia. The plain of Catania, 20 miles long and 15 broad, is the largest plain in the island, and produces a great quantity of corn. The lower hills and valleys which belong to the mass of Ætna produce excellent wine. Oil, silk, and all kinds of fruit are the other chief products of the country.

The town of Catania is on the sea-coast, at the foot of the most S. offsets of Ætna, in 37° 29′ N. lat., and 15° 5′ E. long. Though not the largest, it is the handsomest town in Sicily, and has a population of about 45,000. (Ortolani, *Dizionario Geografico della Sicilia*, 1819; Sorristori, *Saggio Statistico*, 1833; Neigebaur gives it only 40,000.) Catania was a colony from Naxus in Sicily, which Naxus was founded by a colony from Chalcis in Eubœa. (Thucyd., vi. 3.) Catania suffered greatly in the wars between the Carthaginians and Syracuse, and was afterwards taken by the Romans in the first Punic war, who plundered it of its riches and statues. Among other things, a sun-dial from Catania was sent to Rome and placed on the rostra. In antient as well as modern times, Catania has suffered greatly from earthquakes and the eruptions of Ætna, one of which is recorded by Thucydides (iii. 116) as having taken place B.C. 425; and he mentions another as said to have happened B.C. 475. The great earthquake of 1693 destroyed it, but the town has been completely rebuilt since that time. The streets are wide and regular, and the buildings are handsome, being mostly built of lava, faced with limestone and enriched with marble. The people of Catania in general have a better and more cheerful appearance than those of the other Sicilian towns: there is considerable beauty among the fair sex, and the upper classes are sociable, well informed, and very civil to strangers. Several of their noblemen have distinguished themselves for their love of the arts and sciences. The old prince of Biscari, in the last century, formed a splendid collection of sculptures, medals, gems, and other antiques. The Cavaliere Gioeni has formed a rich collection in natural history, and has instituted the academy of natural sciences which bears his name, and publishes valuable memoirs. The Canon Recupero, Ferrara, and other learned men who have investigated the phenomena of Ætna, have also formed valuable collections. The university, which was founded by Alfonso of Aragon in 1445, is frequented by about 500 students, [illegible] a good library, which is open to the public. [illegible] splendid Benedictine monastery and church of San [illegible]na is, after Mafra in Portugal, the largest and finest monastic building in Europe. [illegible] monks are wealthy, and have a museum and a gallery of paintings. The cathedral of Catania, dedicated to Santa Agata, is a vast building, the front is ornamented with [illegible] granite columns taken from the theatre of the antient city. In the square before it is a fountain with an elephant made of lava, bearing on its back a granite obelisk. Catania abounds with charitable institutions, such as hospitals, houses for the destitute, a Magdalen, and a school in which [illegible] the sons of artisans are educated and brought up to various trades. Of the distinguished men of Catania, Mongitore gives a long list in his *Bibliotheca Sicula*. The port of Catania is only fit for small craft, by means of which however a considerable export trade is carried on in wine, corn, oil, almonds, figs, soda, manna, silk, cheese, maccaroni, amber, which is found at the æstuary of the river Giarretta, lava, and snow from Ætna, which is sent to Malta. The Catanese say, 'Se Catania avesse porto, Palermo saria morto,' meaning that if they had a good harbour their city would become far greater than Palermo. Catania has a Gran Corte, or upper tribunal for civil and criminal causes. The town has considerable municipal privileges, which the inhabitants maintain and exercise with spirit and zeal.

Caltagirone, the second town in the province of Catania, is built on two hills joined together by a bridge; it has several palaces, a royal college, a town-house, Monte di Pietà, and about 20,000 inhabitants. Good pottery is made in this place. Caltagirone is a corruption of Calata-Girone; the word Calata, or Kalat, is Arabic, and signifies an eminence. There are several towns in Sicily, the name of which begins with Calata, as Calatascibetta, Calatanisetta, &c., being the names given to them by the Saracens during their sway over Sicily.



[British Museum. Actual size. Silver. 260 grains.]

Nicosia is built on a mountain, with 12,000 inhabitants, who live chiefly by agriculture. The neighbourhood abounds with mineral water, and has a mine of rock-salt. (Neigebaur.) Aci Reale stands on a lava rock, which projects into the sea at the E. base of Ætna, with a castle above it on a higher cliff, which forms a little town by itself. Santa Venera is the protectress of Aci. Paternò, the antient Hybla Major, which gives the title of prince to a Sicilian family, who are the richest landholders in Sicily, has 10,000 inhabitants, many convents and churches, and a fruitful territory. Aderno, at the S.W. base of Ætna, has 6000 inhabitants; and San Filippo d'Argiro, the antient Agyrium, has 7000. The other towns are Traina, Nicolosi, and Bronte.

CATAPLASMS, or poultices, are substances applied externally to different parts of the body, either to allay pain and repress inflammation, or more frequently to promote inflammation or its consequences, and lessen the pain attending it. For the former purpose they are applied cold and generally contain a preparation of lead; for the latter they are of different degrees of temperature. When it is intended to hasten the progress of inflammation so as to lead to suppuration, poultices should be of as high a temperature as the part will bear, but of a lower temperature when they are used as mere emollients. The material of which the poultice is made influences its action, but those are best which have the power of retaining heat and moisture for the greatest length of time. The meal of linseed, especially if the oil has not been expressed previous to reducing the seeds to [illegible] is the best for all common purposes; but John [illegible] complained that this, and all poultices, were generally made too thin. For application to a limited space, such as the lip or eyelid, a roasted apple or fig is best; and a roasted onion is the most suitable application to a boil. Poultices are seldom changed with sufficient frequency. A fresh poultice should always be applied before the one before it has become cold, when the object is to expedite the maturation of a swelling and bring about suppuration. When the surface is broken and suppuration [illegible] it is not necessary to change the poultice so frequently, as it is desirable to exclude the air as much as possible. To cleanse ulcers, the carrot poultice is a good application, and when there is much irritability or fœtor, the yest poultice, or one containing charcoal finely powdered, is best. The face of a poultice is often coated with oil, and sometimes powdered camphor or red bark may be sprinkled on it, according to the object in view.

CATAPULTA. [ARTILLERY, p. 418.]

CATARACT (Gr. καταῤῥάκτης, in its most common sense, 'a fall of water over steep rocks,' also 'a door that shuts to,' 'a bolt, barrier, or obstruction,' from κατα(ρ)-ῥήγ-νυμι, to break down or interrupt), is an opacity of the crystalline lens or its capsule, which obstructs the transmission of light to the retina, and, according to its degree, impairs or destroys the sight.

To understand its nature, and the means adopted for its cure, the following anatomical facts must be borne in mind. The *cornea* or front of the eyeball is a tough, transparent, and slightly protuberant shell, firmly united to the *sclerotic* coat or white part of the eye. Immediately behind the cornea is a space filled by a watery fluid, the *aqueous humour*, in which the co[illegible] *iris* is suspended like a screen. This membrane, attached by its outer edge to the sclerotic near its junction with the cornea, has the power of contraction and expansion, so as to limit the admission of light through its central opening called the *pupil* to the amount best adapted for vision. Behind the iris and nearly touching it is the *crystalline lens*, inclosed in a transparent membranous capsule, which is attached to what are called the *ciliary processes* behind the external border of the iris. The narrow interval between the lens and *uvea* or posterior surface of the iris is called the *posterior chamber*; the more ample space which separates the iris from the cornea is called the *anterior chamber*. The crystalline is a transparent sticky substance of high refracting power, firmer towards the centre or nucleus, more soft as it approaches the capsule, to which it very slightly adheres. It is nearly flat in front and swells out behind into a considerable convexity imbedded in a corresponding hollow of the *vitreous humour*. This fluid fills up the remaining space in the globe: it is inclosed in a pellucid membrane termed the *hyaloid*, and seems to consist of water contained in the interstices of a fine cellular structure, which, dividing it into separate portions, gives it a semi-gelatinous consistence. The delicate expansion of the optic nerve called the *retina* is placed like a cup with the concavity forwards, immediately behind the hyaloid, the edges advancing as far as the attachment of the capsule of the lens; it consequently incloses the whole of the vitreous humour.

The disease we are now in a condition to describe is divided into *true* and *spurious* cataract. The latter term is applied to an obstruction which arises from an opaque film of purulent lymph thrown out by inflammation between the uvea and the capsule, often producing adhesion between these parts, and passing like a gauze blind across the pupil. The usual means which control inflammation in other cases may be used in this, and sometimes effect a cure, but no operation is applicable to it: it may arise from injury, and occurs occasionally in gout and rheumatism and in some forms of secondary syphilis. The antients appear to have considered all cataracts to be of this nature.

True cataract is of three kinds: *lenticular*, when the opacity is confined to the lens; *capsular*, when the capsule only is affected; and *capsulo-lenticular* when both structures participate in the disease. The term, when used simply, is to be understood of the lens itself.

Lenticular cataract.- An important practical division of this complaint is into the hard and soft kinds. The former is the most frequent, and is the variety usually met with in advancing age.* Though called *hard* for the purpose of distinction, it may have any consistence, from that which is natural to the part, or [illegible]ss, to the tenacity of wax. The opacity generally begins [illegible] the nucleus behind the centre of the pupil, and is at first of a bluish-white colour, like milk and water. This gradually spreads towards the circumference, the nucleus in the mean time assuming an amber-coloured or brownish hue, which sometimes becomes as dark as mahogany, and may extend through the whole lens. The firmness of the cataract is found to bear a close relation [illegible]he depth of the tint. Both eyes may be affected at once, but hard cataract more commonly begins in one eye; and after a certain time, from a few months to several years, the other becomes affected in the same manner, and all useful vision is thus gradually destroyed. In this kind of cataract the lens is almost always diminished in bulk, so that upon examination it may be seen to lie at some distance behind the pupil, the movements of which remain free and unembarrassed.

Soft cataract is more frequently single, and prevails in childhood, and the middle period of life. In this form of the complaint the lens, instead of shrinking, commonly enlarges, so as to obliterate the posterior chamber, and press the iris forward towards the cornea. Its texture is everywhere changed and softened: it may be converted into a turbid fluid, in which case the more opaque particles are sometimes observed to subside during rest, or it may have the consistence of soft cheese. The opacity, often streaked and mottled at first, is also general from the commencement, and is found to occupy the whole [illegible] when dilated to the utmost by [illegible]al means. [illegible]ation varies in shade from a mere cloud to the wh[illegible]ness of milk; and in the latter case the light is more completely intercepted than by the darkest hard cataract, which always retains a degree of horny transparency, admitting, for instance, the distinction of shade from sunshine; whereas, in the most opaque soft cataract light can barely be distinguished from darkness.

There is a kind of central opacity more allied to the soft than the hard species, in which the affection is confined to the nucleus, and sometimes circumscribed to a mere speck in its centre, the rest of the lens remaining transparent. This affection is most frequently met with in infancy, if it be not absolutely confined to that age.

Capsular or *membranous* cataract commonly appears in specks or streaks of a pearly or chalk-white colour, without the bluish tint which prevails in the early stages of both the former kinds, and more frequently affects the anterior layer of the capsule than the posterior. In the former situation it is close to the pupil, and is plainly convex; in the latter it is concave, but is not so readily distinguished, as it lies deeper and is seen through the lens, itself usually opaque at the same time: indeed some have doubted the separate existence of opacity in the posterior layer of the capsule, and it is certainly by no means so frequent as in the anterior layer.

Capsulo-lenticular cataract, or that in which both structures are implicated, is much more common. In such cases the lens is usually in the softened state already described. Congenital cataracts are generally of this nature: the opacity, if not *central*, being uniformly diffused, and the consistence never greater, and usually much less, than in the healthy state. It frequently prevails among members of the same family; and has a peculiarity which renders an early performance of the operation of essential importance. This consists in a constant rolling and unsteady motion of the eye-ball, which may become habitual, and preclude the patient from ever acquiring the power of directing the eyes at will towards an object. The capsular varieties, especially those which commence in the anterior layer, are more frequently the result of injury, and complicated with inflammatory conditions of the constitution or of the eye itself, than those in which the opacity is confined to the lens. These last, especially the hard cataracts of advanced life, are often strictly local affections, and can neither be classed with inflammatory disorders, nor traced to any constitutional cause.

The symptoms experienced by a person affected with cataract may readily be imagined. The symptom first perceived is a dim haziness of sight, as if a mist or a thin veil were interposed between the object and the eye. The obscurity is greatest in direct vision; in hard, [illegible] because the opacity is originally central; in soft, because the direct rays pass through the thickest part of the lens, while those which enter laterally are transmitted nearer to the edge, which is comparatively thin. The sight is better, for the same reason, in weak light, and with the back turned to the window, than in strong light; for the pupil in the latter case is contracted, [illegible] of the rays only through the midd[illegible] the advantage derived in all cases from dropp[illegible]ice of the belladonna or deadly nightshade in[illegible]e, which with some other sedative vegetable poison[illegible] the remarkable property of dilating the pupil by [illegible] specific action on the iris independently of the retina. It is a curious circumstance that this effect is not [illegible] by [illegible]cations.

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* Of [illegible]0 cataract patients treated by [illegible] Fabini 268 w[illegible]les and [illegible] females. Their ages were as follows.—from 1 to 10 years, 14[illegible] to 20, [illegible]; 21 to 30, 18; 31 to 40, 19; 41 to [illegible]51; 51 to 60, 102; 61 to 70, 172; 71 and upwards, 109: total, 500.

None of the varieties of the cataract are subject to the influence of any known medicinal remedy, whatever may have been put forward to the contrary for interested purposes; nor is it at [illegible] likely that [illegible] remedy exists with powers capable of [illegible] on [illegible] so obscurely organized, and so completely [illegible] of the cou[illegible] the circulation. No vessels have ever been discovered in the lens under any condition of that part; and it is probably as little endowed with vitality as the hair and nails. Consequently, all the palliation the case admits of is limited to the local application of belladonna, attention to the general state of the health, and care in removing the inflammatory symptoms, with which, as we have seen, it is sometimes complicated. A radical cure can only [illegible]ght about by the actual removal of the cataract.

Much difference of opinion [illegible] existed as to the most eligible way of effecting this [illegible]t; but it is now well understood that each of the meth[illegible] proposed may be the best in its turn, and that the point can only be determined by the circumstances of the particular case.

All the operations for cataract may be classed under three heads, as they are calculated to effect, either its extraction, its displacement from the axis of vision; or its absorption or solution.

Extraction is commonly effected in the following manner:—A fine triangular knife, sharp at the point and the oblique edge, and having the back in a straight line with the handle, and the flat of the blade towards the eye, is steadily and quickly passed through the upper or lower half of the cornea, as near to the iris as possible without touching it. A needle slightly curved at the point is insinuated under the flap thus formed, and brought to bear upon the front of the capsule so as to lacerate it; upon gentle pressure of the globe the lens slips out of the capsule, and easily distending the pupil escapes through the wound in the cornea, which soon heals in favourable cases, and the sight is restored. Spectacles suitably convex must afterwards be worn as a compensation for the refractive power of the lens. This operation is chiefly suited to the hard cataract and the adult age. It is inexpedient in gouty and inflammable subjects, and when the eye is either too prominent or too deep in the orbit.

Displacement of the lens from the axis of vision, which was the method practised by the antients, is effected in several ways; the most usual is that called depression or *couching* (from the French *coucher*, to lay down). A sharp needle, with edges which cut a little way from the point, is introduced perpendicularly through the sclerotic, near its junction with the cornea, and consequently behind the lens; the pupil having been previously dilated by belladonna. The point is then brought forward through the lens, which, by a backward and downward movement of the hand, is drawn out of its place behind the pupil, and lodged under it in the vitreous humour. The opaque body being thus removed, the sight immediately returns; but as the lens may partially rise again into its place, it is often necessary to repeat the operation at intervals, which has been done a dozen times with perfect eventual success. The lens does not produce so much irritation in its new situation as might naturally be expected, and it is commonly absorbed in part or wholly in the course of time. This method of operating is not very frequently resorted to in the present day.

The third kind of operation, which is intended to cause the absorption of the lens, or its solution in the aqueous humour, is performed much in the same way; but instead of drawing the needle backward, the operator pushes it in through the lens into the pupil, and lacerates the anterior capsule. The aqueous humour is thus admitted to act upon the cataract, which perhaps, after several repetitions of the operation, becomes absorbed or dissolved, and vision is thus restored. This mode of operating, with variations which need not be detailed, is generally adopted in soft cataract, and always in congenital cases.

It is not only [illegible] that much discretion should be exercised in the [illegible] and execution of the operation; it must in all cases, more especially in extraction, be preceded and followed by means calculated to prevent inflammation, which often occurs in spite of all precautions, and render the operation worse than useless. It is not u[illegible] thought expedient to operate on one eye while useful vision remains in the other; nor by the method of extraction in [illegible]h eyes at the same time; nor is an operation warrantable when the [illegible] it cannot distinguish light from darkness, which p[illegible]es that some other cause of blindness exists independe[illegible] of the cataract; nor if the iris or other membranes in front of the crystalline be disorganized by previous inflammatio[illegible]. Many other cases might be enumerated in which a[illegible]eration is of questionable propriety. On the whole, ho[illegible]ver, cataract may thus be cured, and useful or even perfect vision restored in a large proportion of cases. The pain of the operation itself is very inconsiderable, nor does any disfigurement or inconvenience arise if it be skilfully performed.

CATARRH, or CORYZA, that is, catarrh in the strict sense of the term, commonly called cold, consists of inflammation of that portion of the mucous membrane of the air passages which lines the nostrils. Inflammation, though often strictly confined to this portion of the lining membrane, when it gives rise to the symptoms known under the name of common cold, or coryza, is very apt to extend beyond the nostrils, when it produces other diseases which are distinguished by different names: when, for example, the inflammation extends from the nostrils into the frontal sinuses, pain, and a sense of weight in the head being superadded to the symptoms of coryza, the affection is called gravedo, catarrhal headache, or cold in the head; when inflammation extends to the back part of the throat, the affection is called cynanche catarrhalis, or catarrhal sore-throat; when to the larynx, laryngitis; and when to the bronchi, bronchitis. [BRONCHITIS.]

The symptoms of coryza are a sense of uneasiness, fullness, heat, and stuffing in the nostrils, frequent sneezing, diminished acuteness or total loss of the sense of smell, together with a slight impediment to the respiration, occasioned by the impeded transmission of the air through the nostrils to the lungs, in consequence of the swelling of the membrane, the degree of the swelling being always in proportion to the severity of the inflammation. [BRONCHITIS.] Though the main seat of inflammation in coryza is always in the lining membrane of the nostrils, yet very constantly a sufficient degree of it extends to the frontal sinuses to occasion some uneasiness there, inducing a sense of fulness, heat, weight, and even pain across the forehead. Occasionally, too, the membrane which lines the tube through which the tears pass into the nose becomes so much swollen that the tears cannot enter it, and consequently flow over the cheek; while the external membrane which is reflected over the eye itself participates in the inflammatory affection, and becomes reddened and painful.

These local disorders are often the only symptoms which exist; but whenever the disease is severe, the system becomes affected, and then to these local symptoms are superadded indications of a general disturbance in the economy. These general disordered functions are uniformly those which indicate a feverish condition of the system, namely, chilliness or coldness succeeded by heat, dryness of the skin, lassitude, stiffness, or a sense of uneasiness, often amounting to pain, in the back and limbs, together with a greater or less degree of headache.

The dryness of the membrane affected, in coryza, the first consequence of inflammation, from the suppression of secretion, gives rise to the irritation, the itching, and the sensation of heat in the nostrils, and more particularly at their entrance. Next comes the acrid fluid already described [BRONCHITIS], which flowing upon the upper lip and the anterior portion of the nostrils, irritates and excoriates them, and which, passing by the posterior nares, into the pharynx, and thence upon the epiglottis and glottis, occasions violent cough; and last of all flows the bland fluid, with the immediate subsidence of all irritation. [BRONCHITIS.] The causes of coryza are precisely the same as those of bronchitis.

Of all the diseases to which the human body is subject, catarrh is the most frequent, at least in this climate, which is subject to such sudden and great changes of temperatu[illegible] [illegible]gic,

its danger is by no means propo[illegible] is never of itself fatal excepting in the [illegible] [illegible]d. But inflammation of the [illegible]ustr[illegible] [illegible]strils, however slight it may be [illegible] spread to other portions of the [illegible]me[illegible] severe, and consequently to occasion serious disease. It is the constant source of bronchitis, it often terminates in inflammation of the substance of the lungs, and it frequently lays the foundation for consumption. Hence whenever there is the slightest appreciable predisposition to disease of the lung, a common cold, in however mild a form it may come on, ought to be attended to with anxious care. Every year many persons apparently in good health at its commencement are dead before its close, in consequence of two or three days' neglect of a cold.

The disease, at first local in its seat, may often be cured at once, or at all events its severity may be lessened and its duration shortened by the application of a local remedy; such as the inhalation through the nostrils of the vapour of warm water, or what, perhaps, is more effectual, the vapour of an infusion of chamomile flowers, or of a decoction of poppy-heads. The steam from these heated fluids should be made to pass through the nostrils for at least the space of a quarter of an hour or twenty minutes at a time. It is important that the temperature of the apartment be maintained uniformly at a moderate degree, about 65°, the sleeping as well as the sitting-room. With a view of determining to the skin, so as to produce a general and gentle perspiration, the feet, immediately before going to bed, may be bathed for twenty minutes in warm water, and the bed warmed. A tumbler full of wine-whey, or a basin of warm gruel, will promote the perspiration, and under this simple treatment the patient will often arise in the morning without the slightest remains of the disease. A mild aperient may be often added with advantage.

When there is any degree of fever, the treatment must be the same as in bronchitis.

CATARRHACTES. [BOOBY, vol. v., p. 161; PENGUIN.]

CATA'STOMUS, a genus of fishes belonging to the abdominal Malacopterygii and family Cyprinidæ. The fishes of this genus are peculiar to the rivers of North America, and the species may be distinguished from others of the carp section by their having the lips thick and pendent and crenated or fringed at the edges; the dorsal fin short as in the genus Leuciscus (which contains the roach, dace, &c.), and opposite to and above the ventral fins. M. Lesueur describes seventeen species of this genus in the Journal of the Academy of Natural Sciences of Philadelphia.

CATCH, in music, a composition of the humorous kind for three or four voices, which owes its origin to this country, and does not appear ever to have travelled out of it. It is a song of as many verses or couplets as parts. The highest part is first sung through alone; the singer of this goes then to the second part, the second voice takes the first, &c., and thus each performer sings through all the parts in succession, and, generally, three times over. The *catch* depends on the distribution of the words among the performers. This is so contrived that a meaning is given to the lines wholly different from that which appears when they are read in a straightforward manner. The catch in 'the good old times,' was, in most instances, abominably obscene and disgusting. Among other improvements in manners the abolition of such offensive productions deserves to be mentioned here. Some good catches, however, but of later date, by Webbe, Callcott, &c., remain, which are exceedingly facetious, and such as may be, and are, introduced at any social meeting with the greatest propriety.

CATCHFLY, a name applied to several plants, which have the property of retaining insects, either by their viscid surfaces or by some other means. In Apocynum androsæmifolium, and some others, they are caught in the hairs that clothe the mouth of the corolla, in Silene, by the glutinous substance that exudes from the calyx; in Dionæa, by the collapsing of the two sides of the irritable toothed leaves. [DIONÆA, or Venus's Fly-trap.]

CATEAU, LE, a small town in France, on the little river Seille or Selle, a feeder of the Escaut. It is on a road from Cambray to Mezieres, 14 or 15 miles from Cambray; in 50° 7′ N. lat., and 3° 32′ E. long. It belonged formerly to the archbishops of Cambray, one of whom built here a magnificent castle with fine gardens attached. The town le[illegible]metimes called Le Cateau or Le Château Cambresis. [illegible] made, in 1559, a treaty of peace between Henry II. at once, but [illegible] II. of Spain, which was by no means [illegible]er. This town was once fortified [illegible] taken in the wars of which [illegible] scene. It was secured to France [illegible] in 1679.

In 1832 the town had a population of 5814; the whole commune, of 5946. [illegible] shawls, soap, starch, and leather are among the [illegible]factured here. Previous to the Revolution there were [illegible] nunneries or monasteries here, besides [illegible] parish churches.

CATECHISM. Almost all our eccles[illegible] terms are of Greek origin, and almost all of them may [illegible] used to some word or some expressi[illegible] sacred [illegible]. It would perhaps hardly be ex[illegible] that to [illegible] comes from a Greek compound word denoting t[illegible]tion of sound, κατηχέω, the reverberation of the [illegible] such is the fact; and the reason that this word has es[illegible]self in ecclesiastical affairs to denote the mode [illegible]uction by question and answer without book, whic[illegible]hat is properly meant by catechizing, is that Saint Paul has used the word in his First Epistle to the Corinthians, xiv., 19, "that by my voice I might teach others," κατηχήσω. The word occurs also in other passages of the Sacred Scriptures, denoting instruction in affairs connected with religion.

Catechizing then, etymologically, and according to the primitive usage, is delivering orally instruction in matters pertaining to religion. Whether in this there was any thing in common with the notions which seem to have pervaded some of the antient systems of divinity, that the mysteries were not to be committed to writing, but only handed down traditionally from age to age, may be doubted, since the practice is so easily explained on what is a mere common-sense principle. Christianity was to present herself to innumerable persons who could receive its truths by the hearing of the ear, while they were unable to peruse any writings in which it might be presented to them. Such persons there have always been in every Christian community, and we are quite sure that when the Christian missionaries addressed themselves to nations but a little removed from a state of barbarism, this mode of instruction was the only mode in which what it was necessary for them to know could be communicated. In such a state of society also their answers to a few simple questions, which they would easily learn by frequent repetition, would be accepted as a sufficient profession of faith entitling them to baptism, confirmation, or a participation in any Christian ordinances.

What, in the infancy of Christianity, was the mode of communicating the elements of Christian truth to persons of all ages, has become in process of time the mode of making such communications to the minds of children only. The reason is obvious: we have now seldom any adults who come with minds wholly unfurnished with the elements of Christian truth, children are therefore the only persons who now need catechetical instruction. We do not speak of the few instances which society even in this country does occasionally present of persons brought up in utter ignorance of religion and its truths and duties. But children, generally speaking, are now the only persons who need this kind of instruction; and when we use the terms *catechize* and *catechumens*, which last word denotes the persons placed under this mode of religious instruction, we refer them at once to children, and children only. The more wide extension of the ability to read has rendered this mode of introducing to the young the knowledge of Christian principles and duties of less importance, though it is still considered a part of pastoral duty belonging to the Christian minister to catechize the young of his flock, and thus to prepare them for the ceremony of confirmation. To say the least, it is an impressive mode of communicating the elements of Christian truth, and it serves throughout the period of after-life to cement an attachment which it is desirable should always exist between the individuals of a Christian flock and their pastor. The greater extension of the ability to read has also produced another change. Catechisms originally intended for the use of the instructor have been transferred to the instructed, who have learned in them the answers which beforetime they were wont to have only from the mouth of the teacher. By far the most celebrated among ourselves of these catechisms is that which is incorporated in the Book of Common Prayer, an intimate acquaintance with which is held to be essential to every person who is a candidate for confirmation. Innumerable other catechisms have been printed, both at home and abroad, in some of which, however, though they are called catechisms, we recognize but faintly the impression of the peculiar character of this mode of instruction, they being rather bodies of [illegible]an divinity exhibited in the form of question and answer. This is the case with the Racovian catechism, which contains the doctrine of [illegible] Socinians. This is the case with the Gene[illegible] which exhibits at much greater length than [illegible] designed to be com[illegible]itted to memory the [illegible] Christian truth as pr[illegible]ed by the pastors of that city. The Assembly of Divines [illegible] Westminster, who, at a time when Presbyterianism was [illegible]scendant in England, were called together to de[illegible] form and order of Christian profession, put forth two catechisms: a larger, containing a [illegible]em of Christian doctrine, with the evidence on which its several parts were supposed to rest; and a smaller, which was intended for the actual catechetical instruction of the young. Both these present a system commonly called Calvinistic.

CATECHU. The ins[illegible]ted extract of the Acacia Catechu is known by this name; but as there are several varieties of this substance, it is probable that it is procured from other species of this genus, as indeed is positively stated by Dr. Wallich, who denies that any catechu is obtained from the areca catechu. Geiger affirms that one variety of catechu is the extract of nauclea gambir (Hunter), which however is generally considered to yield a sort of kino. (See Nees von Esenbeck, in Buchner's *Repert.*, vol. xxii., p. 185, and Dierbach, in *Magaz. für Pharmacie*, vol. xvii., p. 106.) Indeed N. v. Esenbeck confidently assigns the nauclea gambir as the source of the Bengal catechu, and the acacia catechu as the source of most of the Bombay catechu: a statement which receives considerable countenance from the different amount of tannin which they respectively contain, and the difference of their reaction with the salts of iron; their specific gravity also differs, that of Bombay being 1·39, while that of Bengal is only 1·28.

At the season of the year when the sap is most perfectly elaborated, the bark of the Acacia Catechu is removed, and the tree cut down, the outer white part removed, and the remaining brown heart-wood cut into such pieces as can be conveniently introduced into a narrow-mouthed vessel; water is poured in, and then boiled down to one-half the original quantity; the further inspissating is conducted in wide earthen vessels. It is then allowed to stand in the sun, frequently turned, and at last transferred to cloths strewed over with the ashes of cow's dung, and cut into four-square pieces, which are then thoroughly dried in the sun. The darker the wood from which it is obtained, the darker the colour of the extract: it has so much the appearance of a mass of earth as to have been once considered such, and called *terra japonica.* The farina or meal of a seed resembling wheat, and called *nachani*, is often mixed with it, not as an adulteration, but to prevent the soft masses adhering to each other.

Catechu occurs either in irregular pieces or in small cubes, of a dark brown colour; odour very faint; taste powerfully astringent, afterwards bitterish, then sweet. It is nearly completely soluble in water, more perfectly in alcohol. Analysed by Sir H. Davy,—

	Bombay Catechu yielded	*Bengal yielded*
Tannin	109	97
Extractive	68	73
Mucilage	13	16
Impurities	10	14

The Bombay variety is preferable. it is a valuable astringent, and may be employed either to act immediately on the mucous membrane of the digestive organs, or on remote organs. In all cases of relaxation of the tissues, either accompanied with a flow of blood or increased mucous discharges, or without any obvious discharge, catechu renders great assistance in restoring the parts to a healthy condition. In relaxed uvula or pap of the throat, causing irritation and cough, a portion of catechu melted slowly in the mouth is extremely useful. In diarrhœa, from debility, catechu alone, or combined with prepared chalk and opium, is much employed, though chemists disapprove of the combination, on the ground that an inert tannate of lime is formed. It is found however to be practically advantageous. Where the debility is great, aromatics and cordials may be added, provided there be no inflammatory condition of the intestines, a point which should always be most carefully inquired into before administering astringents. [ASTRINGENTS.]

CATEGORY, the word κατηγορία (κατηγορεῖν, to declare, aver), was used by Aristotle to denote a class of things concerning which some one common assertion may be made, or, in other words, which are susceptible of the same pr[illegible]cate. Aristo[illegible] of Categories is the first of the six [illegible] which compo[illegible]on. By the sc[illegible]rs, Curio, Tonstius, Vives, and others, it [illegible]is book of Categories was written, not by A[illegible] the peripatetic philosopher Andronicus, w[illegible]ed the works of Aristotle in the first [illegible] B.C. There appears to be little foundation fo[illegible]ion, since Ammonius, Simplicius, Boethius, and others, in their commentaries on it, indicate no doubt of its genuineness; and the reason for doubt assigned in the analysis of Aristotle's Logic by Dr. Reid in his 'Intellectual Powers,' 1827 (inserted also in Lord Kames's 'Sketches'), namely, an inconsistency in the doctrine of the book of Categories, and that of the books of Analytics, is not founded on fact; though such misconception might well occur about the meaning of the first chapters of the Categories, in which so much subtle and abstruse definition is occasioned by the Greek language having but one word, οὐσία (ousia), to express 'substance' (all the essential and accidental qualities of an object) and 'essence' (all the essential qualities only). Aristotle's frequent mention of the book of Categories, and above all, as Mr. Taylor in his translation remarks, the obscurity and difficulty of the sentences, and the involved diction, are evidence that Aristotle is the author. But similar classifications were formed before the appearance of the *Organon.* In a treatise by the Pythagorean philosopher, Archytas of Tarentum, entitled περὶ τοῦ παντός (concerning the universe, or, as Taylor says, universal terms), the arrangement adopted by Aristotle was set forth and discussed. Through Plato, the disciple of Archytas and preceptor of Aristotle, the theory of the Aristotelian Categories descended from the school of Pythagoras, in whose system 10 was a number replete with sacred mystery (*Denarius Pythagoricus*, by Meursius, c. 12; and *Pythagorean Decad.*, in *Theoretic Arith.*, by T. Taylor, c. 12). The work of Archytas is copiously cited in the commentary of Simplicius on the ten Categories. The extant fragments were also published separately in 1571, 8vo., Venice. Archytas and the other Pythagoreans considered these ten universal ideas as the principles of all things—the causes of the universe,—a doctrine which requires for explanation a reference to the Pythagorean and Platonic theory of ideas. By Aristotle and the peripatetics in general they were proposed merely as comprehensive forms of predication, by which the perplexing variety of human ideas were supposed to be conveniently arranged for the use of the dialectician. All the objects and modes of human thought were thus distributed as species under ten *summa genera*, or universal terms, to facilitate a comprehensive survey of the τὸ πᾶν, the whole physical and metaphysical world, known and unknown. The names of the ten Categories, as enumerated by Aristotle (*Cat.* c. 4, and *Top.* l. i. c. 9) are—1, οὐσία or τί ἐστι; 2, πόσον; 3, ποιόν; 4, πρός τι; 5, ποῦ; 6, πότε; 7, κεῖσθαι; 8, ἔχειν; 9, ποιεῖν; 10, πάσχειν; which are variously expressed in English by different writers. In Dr. Whately's Logic they are rendered as follows: 'substance, quantity, quality, relation, place, time, situation, possession, action, suffering;' but to perceive the meaning of the Greek terms, it must be observed what Aristotle comprehends under each of these general designations: ἔχειν, for instance, is said to signify the having something attached to the person; to be 'booted, armed' (τὸ ἔχειν σημαίνει τὸ ὑποδεδέσθαι, τὸ ὡπλίσθαι. *Cat.*, c. 9); but in the last chapter of the Categories eight modes of having are enumerated. The first four Categories, namely, 'οὐσία, πόσον, πρός τι, ποιόν,' are elaborately explained by Aristotle in four long chapters; the definition of the remaining six is dispatched in a word or two, but the nature and properties of all are more fully defined incidentally throughout the rest of his works. That they are classifications only of words was maintained by some of the antient philosophers (*Philos. Arrangements*, by Harris, p. 16). Concerning the question whether these universals are real existences or merely names or conceptions, see the remarks on the Realists and Nominalists in Dr. Reid's 'Essays,' c. 5 and 6. In the later ages of Latinity these Categories were denominated prædicaments; the name by which they have since been generally designated in the scholastic works on logic, in which they are usually translated and placed as follows: 'substantia, quantitas, qualitas, relatio, actio, passio, ubi, quando, situs, habitus,' and illustrated by the following jar[illegible]n as an aid to memory:

'Arbor, sex, fervore, patres, refrigerat, ustos,
Ruri, cras, stabo, nec tunicatus ero.'

As to the utility of these ten Categories, it may be remarked that they form an essential part of the artificial system of logic, which was rejected as useless by most of the principal philosophical writers of the last three centuries, such as Bacon, Hobbes, Descartes, Locke, Condillac, Reid, Kames, Stewart, Brown, De Stutt Tracy, &c. To maintain among the illiterate the reputation of universal knowledge appears to have been the only purpose to which they were ever applied. They served to support syllogistic argumentation for victory, and supplied a convenient ready-reckoner, by which a prompt solution could be given even to questions beyond the reach of human knowledge, and in reality quite unanswerable. The lovers of satire may turn to Gassendi's 'Exercitationes adversus Aristoteleos,' where the ten Categories are unsparingly treated. The remarks of Hobbes in his Logic (*Opera Philosophica*, 4to., 1688) are no less satirical: 'Fateor me prædicamentorum usum hactenus non magnum perspexisse; cepit opinor Aristotelem libido quædam pro authoritate sua, cum rerum non posset, verborum tamen censum peragendi,' p. 16. So the authors of the Port Royal Logique, ou l'Art de Pensero (Nicole and Arnauld), p. 21, 'Voilà les dix Categories d'Aristote, dont on fait tant de mystères—à dire le vrai, c'est une chose *très peu utile*—toute arbitraire, et qui n'a de fondement que l'imagination—elle accoutume les hommes à se payer de *mots*; à s'imaginer qu'ils savent toutes choses, lorsqu'ils n'en connaissent que des noms arbitraires:' and De Stutt Tracy, 'Logique,' p. 22, 'Cela n'est utile absolument à rien.' It would be endless to quote similar opinions from the best modern works on the subject. On the other side, among the defenders of the Categories are Monboddo, Harris, Gillies, and T. Taylor. Harris, in his elaborate work on the subject (*Philosophical Arrangements*, p. 34), says 'The doctrine of these Categories is a valuable, a copious, a sublime theory—a theory which prepares us to study every thing with advantage:' p. 462, 'There are few theories so great, so comprehensive, so various, as the theory of these Categories: in contemplating them we see whence the sciences and arts all arise—history out of substance: mathematics out of quantity; optics and medicine out of quality and quantity; astronomy, music, and mechanics, out of quantity and motion; painting out of quality and site; ethics out of relation; chronology out of when; geography out of where; electricity, magnetism, and attraction out of action and passion, &c.' In the Categories of Kant (*Kritik der Reinen Vernunft*, 7th ed., 1828), the precise boundaries of human knowledge, *à priori*, are professed to be exhibited; these Categories consist of four primordial classes: 1. quantity, 2. quality, 3. relation; 4. modality; each class containing three Categories: 1. unity, multitude, totality; 2. reality, negation, limitation; 3. substance and accident, cause and effect, action and reaction; 4. possibility, existence, necessity.

That, in treating of extensive subjects, some similar methodical classification is very useful and necessary for perspicuity and brevity, is obvious. A tabulated view of Locke's arrangement of Ideas (his Categories, as they are sometimes named) is given to great advantage on a large sheet prefixed to the edition of his Essay in 1828. Among the antients different names and numbers of Categories were adopted by different sects. by Aristotle and the peripatetics they are variously called καθόλου λόγοι, universal terms; σχήματα κατηγορίας, forms or figures of predication; κατηγορίαι, categories; γένη γενικώτατα, the most comprehensive genera; τὰ πρῶτα δέκα γένη, the ten primary genera. Plato reduced them to five; namely, οὐσία, ταυτότης, ἑτερότης, κίνησις, στάσις; substance, identity, diversity, motion, rest. The Stoics made four: namely, ὑποκείμενα, ποῖα, πῶς ἔχοντα, πρός τί πως ἔχοντα; subjects, substances, modes of being, relative modes of being. Some philosophers have preferred seven: namely, spirit, matter, quantity, substance, figure, motion, rest: others three, namely, subject, accident inherent, accident circumstantial: others make only two, simply, substance and attribute, or subject and accident. Other philosophers arrange all existent things under the following six Categories;

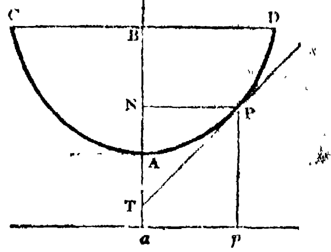
> 'Mens, mensura, quies, motus, positura, figura,
> Sunt, cum materia, cunctarum exordia rerum.'

Cicero and Quintilian name the ten Categories of Aristotle 'Elementa Dialectica.'

(See Ammonius, *Comment. in Categ. Græcè*, 12 Venice, 1545; same in Latin by Silvanius, Paris, 1 Simplicii *Comment. in Prædic. Aristot.*, fol., 1567; *A sis of Aristotle's Works*, by Dr. Gillies, 4to., p. 58, *et seq.*; Monboddo, *Origin* vol. i., p. 317, *et seq.* vol. v., p. 416; and *Anti ics*, vol. i., pp. 26, 311, 329; Boethii *Aristot.* 560, p. 106, *et seq. in Categor.*; Stewart's *Mind*, vol. ii., *on Aristot. Log.*; The *Orga* *nt.* by Pacius, 4to., 1605. The English translation by T. Taylor, 4to., 1812, contains the substance of all the chief Commentaries.

CATENARY (from *Catena*, a chain) is the curve in which a string of perfect flexibility and uniform thickness and density will hang from two points, which we may suppose to be in the same horizontal line, as the nature and properties of the curve will be the same from w it may hang. And all catenaries are similar to say, let there be any number of such curves formed by chains of different lengths, each of them will be a picture, on a reduced or of some portion of the longest.

Various properties of catenaries have been investigated, in cases where the thickness or density of the string are variable. See in particular Creswell's translation of Venturoli's Mechanics, and Whewell's Analytical Statics. We shall here confine ourselves to the most common properties of the catenary, which, with the modifications always required when we come to apply the mathematics of a flexible and inextensible chain to the materials of the architect, is the first step towards the theory of the suspension bridge. Let C and D be the two points of suspension, C A D the chain, of which A is the lowest point, and A B a vertical passing through it. Let the units be inches and ounces (any others might be used), and let the weight of the chain be k ounces to the inch; let t be the length of chain equivalent to the tension at A, and T that equivalent to the tension at P, a point whose abscissa is A N or x, and its ordinate N P or y. Let the length of the arc A P be s, and the angle N T P be θ. Let A a be made equal to t inches, and through a draw a horizontal line $a\,p$. Hence if C A were taken away, and the chain suffered to hang over a fixed point at A down to a, the part D A would not alter its form. And it is the most striking property of the curve, that if the portion D P above any point P were taken away, and the chain suffered to hang over a fixed point at P down to the same horizontal line $a\,p$, the part C A P would be maintained by the portion P p in its position.



The following are the equations which connect T, t, x, y, and θ:

$$\mathrm{T} = t + x = \sqrt{s^2 + t^2},\quad \tan.\theta = \frac{t}{s}$$

$$s = \sqrt{2tx + x^2} = \frac{t}{2}\left(e^{\frac{y}{t}} \qquad \frac{y}{t}\right)$$

where e = base hyp. log. = 2·7182818

$$y = t \text{ hyp. log. } \left(\frac{x}{t} + 1 + \sqrt{\frac{x^2}{t^2} + \frac{2x}{t}}\right)$$

Given the distance between C and D = $2c$, and the length of the whole chain C A D = $2l$, then the value of θ at the point D, supposing a tangent drawn there, must be found by approximating to a solution (θ being unknown) of

$$\frac{c}{l} = \tan.\theta \text{ hyp. log. } \cot.\frac{\theta}{2}$$

which might be solved by inspection, if a sufficient table of the values of the second side were formed. The extreme value of θ being thus found, which call λ, t is found from $t = l \tan.\lambda$, and thence the tension at any point of the curve can be found; and A B, which call h, is found from

$h = \sqrt{l^2 + t^2} - t$. The preceding equation may be thus adapted to the common log[illegible]

$$\frac{\;}{l} \times \cdot 4342945 = \text{tab. [illegible] com. log cot. } \frac{\;}{2}$$

But in practice it would be sufficient to hang up a thin metal [illegible] against two points in a vertical board, in such manner that C D and [illegible] D should represent the lengths required on any convenient scale. Then A N and A P should be measured for several different points, and

$$\frac{(A P)^2 - (A N)^2}{2 (A N)}$$ should be found for each.

If the catenary were perfect these should all give the same result, namely, the required value of t; but as this will not be found to be the [illegible] of the values should be taken.

When A B is small compared with CD, λ must be nearly a right angle, and [illegible] very great. The catenary in that case is very nearly a part of a parabola, which it was supposed to be altogether by Galileo. The focal distance of that parabola is the half of t. We have seen people puzzled to know how a horse on a towing-path draws a heavy boat by a rope which appears slack, and even dips into the water. The reason is, that the tension necessary to pull a long rope into any thing like a straight line, is much greater than that which is necessary to move the boat. A full geometrical account of the catenary, with tables, is given in Ware's 'Tracts on Vaults and Bridges,' London, 1822.

CATENICELLA. [Cellariæa.]

CATENIPORA. [Zoantharia.]

CATERPILLAR, a name given to the larva state of butterflies and moths. As this term is therefore of partial application only, whilst that of larva is applied to the second stage of all insects (*i. e.* that which follows the egg), an account will be given under the latter head. We will now merely notice an ingenious, and we think probable, derivation of the word caterpillar, as given by Mr. Duncan, in Sir William Jardine's 'Naturalist's Library, British Butterflies,' vol. iii. It is as follows: 'The origin of this word is not very obvious, but it no doubt refers to their destructive propensities. The most probable derivation is that which assigns it to the two old French words, *acat*, food or provisions, more recently written *cates*, as in 'Paradise Lost,'

> ——— Alas! how simple to these cates
> Was the crude apple that diverted Eve!

and *piller*, to rob or plunder, whence also we have the word pillage.'

CATHARINA, SANTA. [Brazil.]

CATHARINA I. of Russia. [Peter the Great.]

CATHARINA II., ALEXIEWNA, born in 1729, was the daughter of the Prince of Anhalt Zerbst, governor of Stettin in Prussian Pomerania. Her name was Sophia Augusta von Anhalt. She married in 1745 her cousin Charles Frederic, Duke of Holstein Gottorp, whom his aunt the Empress Elizabeth of Russia had chosen for her successor, having made him Grand Duke of Russia. In adopting the Greek communion he took the name of Peter, afterwards Peter III., and his consort that of Catharina Alexiewna. It was an ill-sorted and unhappy match. Catharina was handsome, fond of pleasure, and at the same time clever, ambitious, and bold. Her husband, although not destitute of good qualities, was greatly inferior to her in abilities, and was irresolute and imprudent. In consequence of many disagreements with his wife, as soon as he came to the throne by the death of the Empress Elizabeth, he talked of repudiating Catharine, who was then living in retirement at Peterhop, a country residence near Petersburg. She, on her part, determined to anticipate him by a bolder movement. A confederacy was formed in which several noblemen, officers, and ladies joined; the regiments of the garrison were gained by bribes and promises; the emperor was arrested, and Catharine was proclaimed sole empress of all the Russias, Peter having been induced to sign an act of abdication, in July, 1762. Six days after, the principal conspirators, [illegible] a reaction in the army which might prove fatal to them, went to Ropscha, where Peter was kept in arrest; and, while [illegible] with him, fell suddenly upon him and strangled him. It does not appear that Catharine actually ordered the murder, but after it was done, she showed no sorrow, and she continued her favour to the murderers. In a proclamation which she issued, it was said that the emperor had di[illegible] the colic. Catharine was solemnly crowned [illegible] Moscow in 1762. We shall not enter on her subsequent private life, and the scandalous chronicles of her court; these matters have been treated with the utmost minuteness by most of her biographers, and especially by Castera. We shall here speak not of the woman but of the sovereign, and record the principal acts of her long reign, which was a most important one for Russia and for Europe. In 1763, on the death of the weak and indolent Augustus III. king of Poland, that country being in a state of exhaustion and confusion, Catharine, by bribing [illegible] of the electors and terrifying the rest, procured the election of one of her favourites, Poniatowski, who was chosen king under the name of Stanislaus Augustus. Having accomplished this, she began to interfere in the internal concerns of that kingdom, whose wretched constitution, with its elective crown, turbulent nobility, serf population, and intolerant clergy, afforded her ample opportunities. In fact, some of the parties in Poland courted her support, as they had been in the habit of courting that of her predecessors and of the other neighbouring states for ages before.

The Dissidents of Poland, which was the name given to those who did not follow the Roman Catholic religion, including both Protestants and followers of the Greek church, were placed upon an equal footing with the Catholics by the Pacta Conventa of 1573, confirmed by the treaty of peace of Oliva in 1660. Since this last epoch, however, the Catholics, being the majority among the high nobility, had gradually excluded the Dissidents from the Diet, and annoyed them in other ways. Early in the 18th century the Dissidents applied to Peter the Great, who remonstrated in their behalf, and obtained by his influence more equitable treatment for them. After Peter's death the Polish Dissidents were again deprived of their political and civil rights: they were excluded from all public offices, were forbidden to build any new church, and many of them were exiled or otherwise persecuted. In 1764 Russia, Prussia, England and Denmark, as guarantees of the peace of Oliva, remonstrated with the diet, but to no purpose. In the session of 1766 the Dissidents were finally subjected to the jurisdiction of the Catholic bishops. In the following year they formed an association, which was called the Confederacy of Thorn, for their common protection, and they were joined by a party of Catholics, who were called Malcontents, upon political grounds, and who now advocated the claims of the Dissidents. The latter were also strongly supported by Russia, the population of which being chiefly of the Greek church felt a lively interest in the fate of their co-religionists, who were very numerous, especially in the east provinces of Poland. In 1768 Russian troops entered Poland and surrounded Warsaw. Several members of the diet, and the bishop of Cracow among them, who were most violent against the Dissidents, were arrested by the Russians, and sent into Siberia, where they remained five years. The diet being now intimidated granted the full claims of the Dissidents. But several Catholic noblemen, especially on the south provinces bordering on Turkey, raised the standard of revolt on mixed religious and political grounds, and a civil war ensued in which the king's troops were defeated. The king and senate at Warsaw petitioned the Russian minister not to withdraw the Russian troops on this emergency, a request which was readily complied with. The insurgents on their part applied to the Turks for assistance, and a war between Turkey and Russia, 1769, was the consequence. During four years Poland was ravaged by civil and religious war, and a dreadful pestilence in 1770 completed the miseries of that country. The result of all this was the first partition of Poland concerted between Catharine, Frederic of Prussia, and Joseph II. of Austria, which was effected in 1772, and was sanctioned by a subservient Polish diet. [Poland.] More than one-third of that kingdom was divided among the three powers. Russia had for [illegible] share the governments of Polotsk and Mohilow, wh[illegible] include a great part of Lithuania and Livonia. Meantime the war with the Turks had proved highly successful to the Russian arms both by sea and by land. Romanzow defeated the Turks on the Pruth, and the Russian fleet in the Mediterranean defeated and burnt the Turkish fleet at Tschesmé in 1770. By the peace of Kainarji, July, 1774, Azof and Taganrog were ceded to Russia, and Crimea was declared independent of Turkey. Not many years after, the Russians took Crimea for themselves, 1785, and made it a province of their empire. In January, 1787, Catharine set off from Petersburg with great pomp to visit her new acquisitions. Her journey was like a triumphal procession. She was joined on the road by the Emperor Joseph II., who accompanied her into Crimea, where they concerted measures for a joint war against Turkey. At Cherson on the Dnieper she inspected the docks constructed by her orders, and saw a ship of the line and a frigate launched. Soon after, the Turks and the Swedes, at the instigation of France and England, declared war against Russia. The object of this war was to check the progress of Russia, but the result was quite the contrary. The Turks were defeated everywhere: they lost Ockzakow; Suwarrow took from them Ismail by storm in 1790, with a dreadful massacre of the garrison, and another Russian army entered Georgia. By the peace of Yassi, in 1792, the frontiers of Russia were extended to the Dniester. The war between Russia and Sweden had been already concluded by the peace of Warela in 1790. Meantime the Poles, taking advantage of the war, had shaken off the influence of Russia, and abrogated the articles of the diet of 1775, which had been dictated by Catharine. In 1791 they formed a new constitution, making the crown hereditary, giving greater privileges to the royal towns, and favouring in some degree the emancipation of the peasants or serfs. But this constitution was far from being acceptable to all the nobles; many protested against it, and so did Catharine of Russia as guarantee of the former constitution. Prussia joined Catharine, and the result was a second partition of Poland in 1793, by which Russia took the whole of Lithuania, Volhynia, and Podolia, and the king of Prussia obtained Posen, Gnesen, and the towns of Danzig and Thorn. In 1794 an insurrection broke out at Warsaw, the Russian garrison was almost entirely destroyed, and the gallant Kosciusko placed himself at the head of the Poles, who fought with the courage of despair. After being successful at first, he was defeated, wounded, and taken prisoner. Suwarrow stormed Praga, the suburb of Warsaw, with a dreadful slaughter of the inhabitants. Warsaw surrendered, the king abdicated, and the third and last partition of Poland took place in 1795. Austria had Galicia, Prussia took Warsaw, and Russia the rest. Poland thus became extinct as a state. Catharine finally annexed Courland also to the Russian empire.

Catharine began now to turn her attention towards France, and had promised to send troops to join the coalition against that country, when, on the 17th November, 1796, she died of an apoplectic fit, after a reign of 35 years. She was succeeded by her son Paul I.

In the internal administration of her vast empire Catharine effected much good. She reformed the judicial system, which was in a most confused state; organized proper courts, and gave suitable salaries to the judges, in order, as she publicly told them, that they might be placed above temptation. She ameliorated the condition of the serfs or peasants. She encouraged instruction, established schools in all the provinces, schools for teachers after the model of those of Germany, and numerous special or higher schools for the military and naval services, for the mining establishment, for the study of medicine and surgery, for oriental languages, &c. She did all she could to promote communication and commerce between the various countries subject to her sway and with foreign states. She was the great regenerator of Russia after Peter I., but with a more enlightened mind and under more favourable circumstances. She began several canals, among others the one called Severo Jekaterinski, which unites the Wolga to the Dwina, effects thus a communication between the Caspian and the White Sea. She founded numerous towns, docks, arsenals, banks, and manufactories. She employed several learned men, among others Pallas, Falk, Gmelin, Blumayer, Billings, and Edwards, to explore the interior and the remotest parts of her empire. Her encouragement of the arts and literature, and the favour she showed to D'Alembert, Diderot, Euler, &c., are well known. Her correspondence with Voltaire has been published, and forms half a volume in the collected edition of Voltaire's works in 69 vols. 8vo. These letters [illegible]

children Alexander and Constantine. But the most remarkable of her works is her 'Instructions to the Commissioners appointed to frame a new Code of Laws for the Russian Empire,' which were translated into English [illegible] M. Tatischeff, London, 4to. 1768. For details concerning her administration, see Tooke's *History of the Reign of Catharine II.*; Count Segur's *Mémoires*, and Rulhière's posthumous works.

CATHARINE DE' MEDICI was the daughter of Lorenzo de' Medici, Duke of Urbino, the son of Piero, and grandson of Lorenzo the Magnificent, and nephew of Leo X. Her mother, Magdeleine de Boulogne, of the royal house of France, died in giving birth to Catharine, her only child, in 1519. Her father died soon after, and Catharine was brought up under the care of her great uncle Cardinal Giulio de' Medici, afterwards Pope Clement VII. She was remarkably handsome, clever, and accomplished, but crafty, proud, and unprincipled. In 1533 she was married to Henry, second son of Francis I. of France. It was a political marriage, contracted between the pope and the king, who met at Marseilles on that occasion. In 1547, Henry having ascended the thro[illegible] the death of his father and elder brother, Catharine became queen of France. Her influence at court was not very great during the reign of her husband, it being checked by that of his mistress, Diana of Poitiers, and that of the powerful family of the Guises. Catharine had by her husband five sons, of whom three reigned successively over France—Francis II., Charles IX., and Henry III. During the short reign of Francis II., who succeeded Henry II. in 1547, the chief influence at court was in the hands of the Guises, whose niece, Mary Stuart, had married Francis II. But when, by the premature death of this young prince in 1560, his brother Charles IX., then a minor, ascended the throne, Catharine as regent became the real ruler of France, and continued as such after her son had attained his majority. She is therefore accountable for all the mismanagement, corruption, and atrocities of that calamitous reign, and, above all, [illegible] the treacherous massacre of the Protestants in August, 1572, which is known by the name of La Sainte Barthélémi, because it was perpetrated on the day dedicated to that saint by the Roman calendar. [Bartholomew, St.] The king of Navarre (afterwards Henry IV.) luckily escaped, and the Protestants defended themselves in several parts of the kingdom, so that the civil war raged again as fiercely as ever. Charles IX. died in 1574, leaving the state in dreadful confusion. His brother, Henry of Valois, was then in Poland, where he had been elected king by the Diet. As soon as he heard of his brother's death, he left Poland in secret and returned to France, where he was crowned in 1575. Henry III. was, like his brother, a weak and corrupt prince. Catharine had brought up her sons purposely in licentiousness and effeminacy, in order that she might more easily govern [illegible]. The reign of Henry III. was distracted by the intrigues of his favourites, of the queen mother, and of the Guises; by the civil wars between Protestants and Catholics, and by the war between France and Spain. Catharine, according to her usual policy, favoured sometimes one party and sometimes the other, for fear that any one of them should become too powerful for her to manage. At last assassination was resorted to again in order to get rid of the Guises. The Duke of Guise and the cardinal his brother were murdered at Blois in December, 1588, by order of the king. On the 5th January, 1589, Catharine herself died at Blois, an object of aversion to all parties. She was one of the worst sovereigns that ruled over France since the times of the Merovingian dynasty. Even her ambition was not of an enlarged kind; it was narrow, wavering, treacherous, and undecided, and it led to no final result. It was the policy of the petty Italian states of the middle ages, rather than one suited to a great empire. The country was in a state of greater confusion at her death than it had been at any time during her sway; the monarchy was near its dissolution, and it required all the address and the brilliant qualities of Henry IV. to rescue it from total ruin. Catharine had only one redeeming quality—her love for the arts and literature, which seems to have been hereditary in the family of Medici. She collected valuable manuscripts, she encouraged artists, and she began the palace of the Tuileries. She was prodigal in her expenditure, and died much in debt. (De Thou, Sully, Brantôme, and the other French historians and biographers.)

CATHARINE OF ARAGON. [Henry VIII.]

CATHARINE PARR. [Henry VIII.]

CATHARINE OF BRAGANZA. [Charles II.]

CATHARINE HALL, Cambridge, was founded in 1475, by Robert Woodlark, D.D., chancellor of the University and provost of King's College, who endowed it for a master and three or more [illegible]llows. The visitors, who were sent down to the unive[illegible] by King Edward VI., ordained that there should be [illegible] six fellows, and that for the future there should be a [illegible] or less number in proportion to the revenues of the [illegible]llege. The fellows must be natives of England, and there cannot be more than two of the same county at the same time; two of them at least must be in priest's, and one in deacon's orders. Whenever a vacancy occurs, the senior who is not in such orders must take them in the course of twelve months (unless a junior does of his own accord), or he vacates his fellowship. There are also eight bye fellowships, founded by subsequent benefactors; one by Mr. Frankland, appropriated to Coventry School, elected by the master and fellows, under the recommendation of the mayor and aldermen of Coventry; one by Mr. Holway, which is called the conduct-fellowship; and six by Mrs. Mary Ramsden, of Norton, in Yorkshire, with a preference first to natives of Yorkshire, then of Lincolnshire; and in case no such candidates duly qualified offer themselves, the fellowships are open to candidates of any county. Fellows on this foundation are not required to take orders; and all persons are ineligible to these fellowships who are twenty-four years of age. The fellows on this foundation are called Skirne Fellows. Mrs. Ramsden also founded ten scholarships, with the same preference to Yorkshire and Lincolnshire, which are now of the value of 35*l.* per annum each, with chambers rent-free. Mr. Frankland also founded one scholarship of 10*l.* per annum, which is appropriated to a person educated at Tamworth School. Mr. Holway founded two of 6*l.* per annum each, which are appropriated to persons educated at Eton or Merchant Taylors Schools. There are also three scholarships of 20*l.* 14*s.* 4*d.*, eight of 20*l.*, one of 12*l.*, five of 5*l.*, seven of 4*l.*, two of 3*l.* 6*s.* 8*d.*, two of 2*l.* 13*s.* 4*d.*, and two of 2*l.* per annum each, all perfectly open. The chapel-clerk receives 20*l.* per annum and commons, with chambers rent-free. Queen Anne annexed a prebend of Norwich to the mastership of this college. The king is the visitor. In point of patronage, there are but four livings in the gift of the society, viz., the rectory of Coton in Cambridgeshire, those of Gimingham and Trunch in Norfolk, and the vicarage of Ridgewell in Essex; the total annual income of which, according to the 'Ecclesiastical Revenues' Report,' is 1158*l.* The present society of the college (1836) consists of 190 members.

Among the eminent persons educated at Catharine Hall, may be reckoned John Bradford the celebrated martyr, Archbishop Sandys, John Strype the antiquary, Ray the naturalist, Dr. Lightfoot the orientalist, Bishop Blackall, Bishop Hoadly, and Bishop Sherlock. The last mentioned prelate bequeathed his valuable library to the college, and founded the librarianship, worth 20*l.* per annum, with rooms rent free; he also considerably augmented the salary of the master's sizar.

Catharine Hall is a brick edifice, situated on the west side of Trumpington Street; the buildings occupy three sides of a court, the east side being open to the street. The chapel, hall, &c. are on the north side of the court; the master's lodge on the south side. The chapel was consecrated in the year 1704. In the ante-chapel is a monument for the lady of Sir William Dawes, Bart., master of the hall, and afterwards archbishop of York; that of Dr. John Eachard, another master, who was a benefactor, who died in 1697; and the tomb of Dr. John Addenbrooke, fellow of the college, and founder of the hospital which goes by his name, who died in 1719. (Lysons's *Magna Brit.* for Cambridgeshire; *Cambr. Guide*, and the *Cambr. Univ. Calendar* for 1836.)

CATHARISTES. [VULTURIDÆ.]

CATHARTES. [VULTURIDÆ.]

CATHARTICS are material agents which cause a transient but special irritation of the intestinal canal, followed by alvine dejections. It is not necessary that these substances should be placed in direct or immediate contact with the mucous membrane of the intestines, either at its upper extremity (the mouth) or at its lower extremity (the rectum); many of them, when applied to the skin, or injected into a vein, will produce the same effect. This irritation is felt at first merely by the mucous membrane, but secondarily it excites the muscular coat so as to increase the peristaltic and vermicular motions of the intestines. The irritati[illegible] differs in kind and degree. When it affects the memb[illegible] merely so far as to occasion a gentle local action, and [illegible] followed only by the expulsion of the matter then resting upon or cover[illegible]t, without augmenting the quantity or altering the nature of this matter, the agents which produce such effect are termed *laxatives.* But if the action be more considerable, and not only the present contents be expelled by their effect, but also [illegible] of the secretions of the canal be increased, and their quality perhaps greatly altered, they are termed *purgatives:* and, according to the particular secretion which they most obviously augment, they receive their appropriate name—cholagogues, if it be the bile; hydrogogues, if merely the serous fluid. Their effects also frequently extend to the whole system. If their action be very violent, they are designated *drastic* purgatives.

To comprehend fully the manner in which cathartics act, it is necessary to direct our attention to the structure and functions of the intestinal canal. This canal extends from the mouth to the rectum, comprising the organ [illegible] taste and mastication, of insalivation, the stomach, and [illegible] small and large intestines. It is lined with a mucous membrane, the folds or plaits of which increase its surface, while the follicular glands which it possesses pour out a viscid mucous, a certain quantity of which is essential to the due execution of its office: this quantity is often much increased by certain purgatives, as we see by the glairy mucous stools. Independently of the juices poured from the glands and vessels into the stomach, the duodenum, or upper small intestine, receives the extremity and contents of the gall-duct and that of the pancreas. Many purgatives in their passage stimulate these ducts, and excite the glands connected with them to increased action. Beneath the mucous membrane is the muscular coat, the chief agent in effecting the propulsion of the contents of the canal. It consists of two sets of fibres, the one arranged in a longitudinal direction, the other in a circular manner. The regular and progressive contraction of these is necessary to move the contents of the canal onwards along its course. The contraction of the one resembling the contractions of a worm in its progress, is termed *vermicular*, and the other *peristaltic*. When their contractions do not harmonize, colicky pains are felt, and are of frequent occurrence during the operation of purgatives, many of which powerfully stimulate this coat to action. When the muscular coat has its action inverted, and the contractions take place from below upwards, instead of from above downwards, it is termed the *anti-peristaltic* motion, by which the contents of the intestines are often ejected by the mouth, as happens in ileus and some other diseases. The last coat or serous membrane, called also peritoneal coat, only obeys the laws of the preceding two in respect to its motion or quiescence. In addition to these structures, the intestines receive numerous arteries, and when an irritant affects them, the blood flows thither in increased quantity. The contact of a purgative causes the capillaries to enlarge; the inner surface of the intestines becomes redder, swollen, and warmer—a state generally followed by a large increase of the serous exhalation from the extremities of these vessels. Lastly, the nerves of the intestines are mostly derived from the ganglions of the great sympathetic, by which an important connexion and sympathy is kept up between the intestines, the brain, and spinal chord.

All parts of the intestines do not feel in an equal degree the effect of a cathartic irritant. Some purgatives act more on one part than another, but it may be stated generally that the duodenum, the colon, and the rectum are most under the influence of them. Cathartics also differ essentially in their mode of action, as well as in general in dose, according as they are derived from the mineral or vegetable kingdom. All those from the mineral kingdom, with the exception of calomel, are neutral salts, and are in their secondary effect pre-eminently antiphlogistic, while their dose is considerable. Owing to their solubility they are frequently given dissolved in water, which influences their action. Those from the vegetable kingdom have nearly all a more or less fœtid odour, which often causes the stomach to revolt, and occasions nausea. Their impression upon the organs of taste is often bitter and very disagreeable. They generally contain a large proportion of bitter and extractive matters, resins, and gum-resins. Their dose is often very small, from a quarter or half a grain to a very few grains: hence they are often administered in the form of pill, bolus, [illegible]der, or electuary, more rarely dissolv[illegible] water, some-[illegible]es in wine or alcohol, or in the form of [illegible]ract simple or [illegible]coholic. Several of those from the vegetable kingdom may [illegible] applied to the skin, and will produce the usual effect either by rubbing in, as with castor-oil, or when spread on the face of a poultice and applied over the abdomen for a short time. Scarcely any articles from the animal kingdom are used as purgatives, though [illegible] gall and the roe of certain fishes are deemed laxatives. Many fruits, both [illegible] their [illegible] state or preserved, such as prunes, are [illegible] cathartic. The sudden application of cold to the surface of the body frequently has a useful cathartic action.

By the combination of many purgative substances in the same prescription, [illegible] effect is rendered more certain, and at the same time milder. It is also frequently very advantageous to combine purgatives with emetics, or with tonics

With respect to the practical employment of purgatives, general rules only can be given here. There is scarcely any disease in which they have not been employed, or at least recommended; but as much injury may result from their injudicious or unnecessary employment, as good from their careful selection and proper application. The circumstances which call for their use are either where an individual, enjoying otherwise sound health, has not that regular action of the bowels which is at once needful for his present comfort, and desirable as a safeguard against disease; or else when the system is labouring under some other malady, the symptoms of which are aggravated by the retention in the bowels of their contents, which, under such circumstances, are very apt to be of an unhealthy kind But as these states may occur in individuals of every constitution, and may be accompanied, in the latter case, with many other symptoms which require to be taken into consideration, it is obvious that it is not enough that some purgative medicine be administered: an appropriate selection is necessary. Hence in the course of the same disease (for example, during continued fever), though purgative medicines may be necessary through its whole course, very different medicines must be employed towards the latter stage from those at the beginning. No person unacquainted with medicine would think of treating a case of severe fever, where professional assistance could be obtained, but yet in other diseases, or even where there is no disease, unprofessional persons undertake to decide for themselves or others when a purgative medicine is necessary, and what it should be. The late Dr. Reid stated it as his conviction, derived from extensive observation at a dispensary, that one half of the children that died in London under two years of age were killed by mothers and nurses dosing them with rhubarb and magnesia. For very delicate children nothing can be worse than the frequent use of magnesia. Even grown up persons may be injured by it, either by its debilitating action, or by its accumulating in the intestines: a mass weighing six pounds has been found in the intestines of a person who had frequently used it. Drastic purgatives, especially of a resinous kind, such as scammony or camboge, when frequently repeated, deprive the inner coat of the intestines of its covering of mucus, and excite inflammation, which often terminates fatally. Excessive purging also may result from an over-dose, and plunge the person into such a state of debility as to place him in imminent danger, or even cause death, either immediately or remotely.

Habitual constipation certainly requires to be remedied, but this is best done by mild laxatives, diet, and proper exercise. When the fault is in the rectum merely, enemata of warm water or gruel may be used, for a few times at first, to remove and prevent accumulations in this part of the bowel. But even these apparently simple means should not be had recourse to without medical advice, as the nature of the constitution of the individual must be taken into consideration, and certain precautions observed. It is frequently serviceable to confine persons of a scrofulous habit to the house during the use of purgatives, as they are peculiarly liable to be affected by cold before their operation has passed off. The opposite state to constipation, diarrhœa or looseness, is often best treated by purgatives, especially if it arise from the presence of any undigested food, or unhealthy secretions in the intestine The mucous fever and diarrhœa of children yields to purgatives sooner than to any other means. The same may be said of many spasmodic diseases, especially in children and females; but as in the treatment of these complaints medical superintendence cannot be dispensed with, we deem further remarks unnecessary. (Hamilton *on Purgative Medicines*, 8th ed.)

CATHARTINE. [Cassia.]

CATHAY. [China.]

CATHEDRAL. Certain churches are called cathedrals or cathedral churches. They are so called in consequence of having a seat of dignity (*cathedra*, a Greek term for such a seat) appropriated to a bishop or archbishop. Thus there is the cathedral church of Canterbury, the cathedral church of Norwich, the cathedral church of Wells. They have usually also a dean and body of canons or prebendaries, but this is not essential to constitute a cathedral church, nor is every church that has a chapter of canons a cathedral church. [Bishop and Canon.]

CATHOLIC CHURCH (Roman). Although in ordinary language this name is often used to designate the ruling authority or power in the Catholic religion, as if distinct from the members of that communion, yet the definition which Catholics give of the church is such as to comprehend the entire body of its members as well as its rulers, the flock as much as the [illegible]. Thus we hear of Catholics being under the dominion of their church, or obliged to obey it, as though it were something distinct from themselves, or as if they were not a part of their church. This preliminary remark is made to explain a certain vagueness of expression, which often leads to misapprehension, and serves as the basis of incorrect ideas regarding the peculiar doctrines of that church—a vagueness similar to what is frequent in writing and speaking on jurisprudence; as for example, where the government of a country is considered as a power distinct and almost at variance with the nation which it rules, and not an integral part thereof.

The Catholic church therefore is defined to be the community of the faithful united to their lawful pastors, in communion with the see of Rome or with the pope, the successor of St. Peter and vicar of Christ on earth.

Simply developing the terms of this definition, we will give a brief sketch of the constitution or fundamental system of this church, under the heads of its government, its laws, and its vital or constitutive principle.

I. The government of the Catholic church may be considered monarchical, inasmuch as the pope is held in it to be the ruler over the entire church, and the most distant bishop of the Catholic church holds his appointment from him, and receives from him his authority. No bishop can be considered lawfully consecrated without his approbation. The dignity or office of pope is inherent in the occupant of the see of Rome because the supremacy over the church is believed to be held in virtue of a commission given to St. Peter, not as his own personal prerogative, but as a part of the constitution of the church, for its advantage, and therefore intended to descend to his successors; as the episcopal power did from the apostles to those who [illegible] them in their respective sees.

The election of the pope therefore devolves upon the clergy of Rome, as being their bishop; and it is confided to the college of cardinals, who, bearing the titles of the eldest churches in that city, represent its clergy, and form their chapter or electoral body. The meeting or chapter formed for this purpose alone is called a *conclave*. The cardinals are in their turn appointed by the pope, and compose the executive council of the church. They preside over the various departments of ecclesiastical government, and are divided into boards or congregations, as they are called, for the transaction of business from all parts of the world; but every decision is subject to the pope's revision, and has no value except from his approbation.

On some occasions they are all summoned together to meet the pope on affairs of higher importance, as for the nomination of bishops, or the admission of new members into their body; and then the assembly is called a *consistory*. The full number of cardinals is 72, but there are always some hats left vacant.

The Catholic church being essentially episcopal is governed by bishops, who are of two sorts, bishops in ordinary, and vicars apostolic. By the first are meant titular bishops, or such as bear the name of the see over which they rule; as the Archbishop of Paris, or of Dublin; the Bishop of Cambray or New Orleans. The manner of appointing such bishops varies considerably. Where they are unshackled by the government, the clergy of the diocese meet in chapter, according to old forms, and having selected three names, forward them to the Holy See, where one is chosen for promotion. This is the case in Ireland, Belgium, and perhaps in the free states of America. In most countries however the election of bishops is regulated by *concordat*, that is, a special agreement between the pope and the civil government. The presentation is generally vested in the crown; but the appointment must necessarily emanate from the pope.

The powers of bishops, and the manner of exercising their authority, are regulated by the [illegible]on law; their jurisdiction on every point is clear an[illegible], and leaves no room for arbitrary enactments or oppressive measures. Yet it is of [illegible]acter as, generally considered, can perfectly [illegible] ferior orders of clergy, and secure them to the [illegible] harge of their duty. In most Catholic countries there is [illegible] rtain degree of civil jurisdiction allowed to the bishops, [illegible] judicial powers, in matters of a mixed character; as in [illegible] rtaining to marriages, where a distinction be[illegible] and ecclesiastical marriage has not been drawn by the legislature. Some offences connected with religion, as blasphemy or domestic immorality, are likewise brought under their cognizance.

Where the succession of the Catholic hierarchy has been interrupted, as in Engl[illegible] never been established, as in Australasia or some parts of India, the bishops who superintend the Catholic church and represent the papal authority, are known by the name of *vicars apostolic*. A vicar apostolic is not necessarily a bishop—an instance of which we have now at Calcutta—where the vicar apostolic is a simple priest. Generally however he receives episcopal consecration; and, as from local circumstances, it is not thought expedient that he should bear the title of the see which he administers, he is appointed with the title of an ancient bishopric now in the hands of infidels, and thus is called a bishop *in partibus infidelium*, though the last word is often omitted in ordinary language. A vicar apostolic, being generally situated where the provisions of the canon law cannot be fully observed, is guided by particular instructions, by precedents and consuetude, to all which the uniformity of discipline through the Catholic church gives stability and security. Thus the vicars apostolic, who rule over the four episcopal districts of England, have their code in the admirable constitution of Pope Benedict XIV., beginning with the words *Apostolicum ministerium*. The powers of a vicar apostolic are necessarily more extended than those of ordinary bishops, and are ampler in proportion to the difficulty of keeping up a close communication with Rome. Thus many cases of dispensation in marriage which a continental bishop must send to the Holy See may be provided for by an English or American vicar apostolic; and other similar matters, for which these must consult it, could at once be granted by the ecclesiastical superiors of the Mauritius or of China. The nomination of vicars apostolic is solely with the pope.

The inferior clergy, considered in reference to the government of the church, co[illegible] mainly of the parochial clergy, or those who supply th[illegible]ce. In all countries possessing a hierarchy, the country is divided into parishes, each provided with a *parochus* or *curate*,* corresponding to the rector or vicar of the English established church. The appointment to a parish is vested in the bishop, who has no power to remove again at will, or for any cause except a canonical offence juridically proved. The right of presentation by lay patrons is, however, in particular instances fully respected. In Italy the parish priests are generally chosen by competition; as upon a vacancy, a day is appointed on which the testimonials of the different candidates are compared, and they themselves personally examined before the bishop in theology, the exposition of scripture, and extemporaneous preaching: and whoever is pronounced, by ballot, superior to the rest, is chosen.

Under an apostolic vicariate, the clergy corresponding to the parochial clergy generally bear the title of *apostolic missionaries*, and have *missions* or local districts with variable limits placed under their care; but are dependent upon the will of their ecclesiastical superiors.

Besides the parochial clergy, there is a considerable body of ecclesiastics, who do not enter directly into the governing part of the church, although they help to discharge some of its most important functions. A great number of *secular* clergy are devoted to the conduct of education, either in universities or seminaries; many occupy themselves exclusively with the pulpit; others with instructing the poor, or attending charitable institutions. A certain number also fill prebends, or attend to the daily service of cathedrals, &c.; for in the Catholic church, pluralities, where the cure of souls exists, are strictly prohibited, and consequently a distinct body of clergy from those engaged in parochial duties, or holding rectories, &c. is necessary for those duties. Besides this auxiliary force, the *regular* clergy, or monastic orders, take upon them many of these functions. These institutions, [illegible]er closely connected with the church, ma[illegible] require a[illegible] explanation in their proper place. The cler[illegible]y of the [illegible]olic church [illegible] the west are bound by a vow of celi[illegible] not formally [illegible], but implied in their ordination as sub-deacons. This obligation of celibacy is only reckoned among the disciplinary enactments of the church. The clergy of that portion of the Greek and Armenian church which is united in [illegible]n with the see of Rome, may be married; that [illegible] receive orders if married, but are not allowed to marry after having taken orders. A similar discipline, if thought expedient by the church, might be introduced into the west.

The only point concerning the governm[illegible]f the Catholic church which remains to be me[illegible]ed [illegible] manner in which it is exercised. The most solemn [illegible]bunal is a *general council*, that is, an assembly of all the bishops of the church, who may attend either in person or by deputy, under the presidency of the pope or his legates. When once a decree has passed such an assembly, and received the approbation of the Holy See, there is no further appeal. Distinction must be however made between *doctrinal* and *disciplinary* decrees; for example, when in the council of Trent it was decreed to be the doctrine of the church, that marriage is indissoluble, this decree is considered binding in the belief and on the conduct, nor can its acceptance be refused by any one without his being considered rebellious to the church. But when it is ordered that marriages must be celebrated only in presence of the parish priest, this is a matter of discipline, not supposed to rest on the revelation of God, but dictated by prudence; and consequently a degree of toleration is allowed regarding the adoption of the resolution in particular dioceses. It is only with regard to such degrees, and more specifically the [illegible]ne we have mentioned, that the council of Trent is said to have been received, or not, in different countries.

When a general council cannot be summoned, or when it is not deemed necessary, the general government of the church is conducted by the pope, whose decisions in matters of discipline are considered paramount, though particular sees and countries claim certain special privileges and exemptions. In matters of faith it is admitted that if he issue a decree, as it is called, *ex cathedrâ*, or as head of the church, and all the bishops accept it, such definition or decree is binding and final.†

The discipline or reformation of smaller divisions is performed by provincial or diocesan synods. The first consist of the bishops of a province under their metropolitan; the latter of the parochial and other clergy under the superintendence of the bishop. The forms to be observed in such assemblies, the subjects which may be discussed, and the extent of jurisdiction which may be assumed, are laid down at full in a beautiful work of the learned Benedict XIV., entitled 'De Synodo Diœcesana.' The acts and decrees of many such partial synods have been published, and are held in high esteem among Catholics; indeed, they may be recommended as beautiful specimens of deliberative wisdom. Such are the decrees of the various synods held at Milan under the virtuous and amiable St. Charles Borromeo.

II. The *laws* of the Catholic church may be divided into [illegible]wo classes, those which bind the interior, and those which [illegible]egulate outward conduct. This distinction, which corresponds to that above made, between doctrinal and disciplinary decrees, may appear unusual, as the term *laws* seems hardly applicable to forms of thought or belief. Still, viewing, as we have done, the Catholic church under the form of an organized religious society, and considering that it professes [illegible]o be divinely authorized to exact interior assent to all that [illegible]t teaches, under the penalty of being separated from its communion, we think we can well classify under the word *law* those principles and doctrines which it commands and expects all its members to profess.

Catholics often complain that doctrines are laid to their charge which they do not hold, and in their various publications protest against their belief being assumed upon any but authoritative docume[illegible]; and as such works are perfectly accessible, the complaint must appear reasonable as well as just. There are several works in which an accurate account is given of what Catholics are expected to believe, and which carefully distinguish between those points on which latitude of opinion is allowed, and such as have been fully and decisively decreed by the supreme authority of the church. Such are Veron's 'Regula Fidei,' or Rule of Faith, a work lately translated into English, and Holden's 'Analysis Fidei.' But there are documents of more authority than these; for example, the 'Declaration' set forth by the vicars ap[illegible] bishops in England, in 1823, often republished; an[illegible]ore the 'Catechismus ad Parochos,' or 'Catechism of the Council of Trent,' translated into English not many years ago, and published in Dublin. A perusal of such works as these will satisfy those who are desirous of full and accurate information regarding Catholic tenets, their real nature, and show that the popular expositions of their substance and character are generally incorrect.

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* To avoid mistakes, we may observe that the parish priest in Ireland corresponds to the curé in France, the curato (or, in the country, arciprete) of Italy, and the cura of Spain. The curate in Ireland, as in the church of England, is equivalent to the vicaire of France and the sotto-curato of Italy.

* The great differen[illegible] Tran[illegible]alpine and Cisalpine divines, as they are termed, is whether such a decree ha[illegible] its force prior to, or independent of, the accession of the body of bishops to it, or receive its sanction and binding power from their acceptance. Practically there is little or no difference between the two opinions; yet this slight variety forms a principal groundwork of what are called the liberties of the Gallican church.

The formulary of faith, which persons becoming members of the Catholic church are expected to recite, and which is sworn to upon taking any degree, or being appointed to a chair in a university, is the creed of Pius IV., of which the following is the substance:—

The preamble runs as follows: 'I, N. N., with a firm faith believe and profess all and every one of those things which are contained in that creed, which the holy Roman church maketh use of.' Then follows the Nicene creed.

'I most steadfastly admit and embrace apostolical and ecclesiastical traditions, and all other observances and constitutions of the same church.

'I also admit the holy scriptures, according to that sense which our holy mother the church has held and does hold, to which it belongs to judge of the true sense and interpretation of the scriptures: neither will I ever take and interpret them otherwise than according to the unanimous consent of the fathers.

'I also profess that there are truly and properly seven sacraments of the new law, instituted by Jesus Christ our Lord, and necessary for the salvation of mankind, though not all for every one, to wit. baptism, confirmation, the eucharist, penance,* extreme unction, holy orders,† and matrimony: and that they confer grace; and that of these, baptism, confirmation, and order cannot be reiterated without sacrilege. I also receive and admit the received and approved ceremonies of the Catholic church, used in the solemn administration of the aforesaid sacraments.

'I embrace and receive all and every one of the things which have been defined and declared in the holy Council of Trent, concerning original sin and justification.

'I profess likewise that in the mass there is offered to God a true, proper, and propitiatory sacrifice for the living and the dead: and that in the most holy sacrament of the eucharist there is truly, really, and substantially, the body and blood, together with the soul and divinity of our Lord Jesus Christ; and that there is made a change of the whole substance of the bread into the body, and of the whole substance of the wine into the blood, which change the Catholic church call *transubstantiation.* I also confess that under either kind alone Christ is received whole and entire, and a true sacrament.

'I firmly hold that there is a *purgatory*, and that the souls therein detained are helped by the suffrages of the faithful.

Likewise, that the saints reigning with Christ are to be honoured and invocated, and that they offer up prayers to God for us: and that their relics are to be had in veneration.

'I most firmly assert that the images of Christ, of the mother of God, and also of other saints, ought to be had and retained, and that due honour and veneration are to be given them.

'I also affirm that the power of indulgences was left by Christ in the church, and that the use of them is most wholesome to Christian people.

'I acknowledge the holy Catholic Apostolic Roman church for the mother and mistress of all churches: and I promise true obedience to the bishop of Rome, successor to St. Peter, prince of the apostles and vicar of Jesus Christ.'

Then follow clauses condemnatory of all contrary doctrines, and expressive of adhesion to all the definitions of the Council of Trent.

It is obvious that this form of confession was [illegible] accordance to the decrees of that council, and consequently has chiefly in view the opinions of those who followed the Reformation. It would be foreign to our purpose to enter into any explanations of the doctrines here laid down, much less into any statement of the grounds on which Catholics hold them, as we purposely refrain from all polemical discussion.

Such is the doctrinal code of the Catholic church; of its moral doctrines we need not say anything, because no authorised document could be well referred to that embodies them all. There are many decrees of popes condemnatory of immoral opinions or propositions, but no positive decrees. Suffice it to say, that the moral law, as taught in the Catholic church, is mainly the same as other denominations of Christians profess to follow.

Of the disciplinary or governing code we have already spoken, when we observed, [illegible] it consisted of the Canon Law, which, unlike the doctrinal and moral code, may vary with time, place, and accidental circumstances.

III. Our last head was the essential or constitutive principle of the Catholic church. By this we mean that principle which gives it individuality, distinguishes it from other religions, pervades all its institutions, and gives the answer to every query regarding the peculiar constitution outward and inward of this church.

Now, the fundamental position, the constitutive principle of the Catholic church, is the doctrine and belief that God has promised, and consequently bestows upon it, a constant and perpetual protection, to the extent of guaranteeing it from destruction, from error, or fatal corruption. This principle once admitted, every thing else follows. 1. The infallibility of the church in its decisions on matters concerning faith. 2. The obligation of submitting to all these decisions, independently of men's own private judgments or opinions. 3 The authority of tradition, or the unalterable character of all the doctrines committed to the church: and hence the persuasion that those of its dogmas, which to others appear strange and unscriptural, have been in reality handed down, uncorrupted, since the time of the apostles, who received them from Christ's teaching. 4 The necessity of religious unity, by perfect uniformity of belief: and thence as a corollary the sinfulness of wilful separation or schism, and culpable errors or heresy. 5. Government by authority, since they who are aided and supported by such a promise must necessarily be considered appointed to direct others, and are held as the representatives and vicegerents of Christ in the church. 6. The papal supremacy, whether considered as a necessary provision for the preservation of this essential unity, or as the principal depository of the divine promises. 7. In fine, the authority of councils, the right to enact canons and ceremonies, the duty of repressing all attempts to broach *new* opinions: in a word, all that system of rule and authoritative teaching which must strike every one as the leading feature in the constitution of the Catholic church.

The differences, therefore, between this and other religions, however complicated and numerous they may at first sight appear, are thus in truth narrowed to one question; for particular doctrines must share the fate of the dogmas above cited, as forming the constitutive principle of the Catholic religion. This religion claims for itself a complete consistency from its first principle to its last consequence, and to its least institution, and finds fault with others, as though they preserved forms, dignities, and doctrines which must have sprung from a principle by them rejected, but which are useless and mistaken, the moment they are disjoined from it. Be this as it may, the constitution of the Catholic church should seem to possess, what is essential to every moral organized body, a principle of vitality which accounts for all its actions, and determines at once the direction and the intensity of all its functions.

To conclude our account of the Catholic church, we will give a slight view of the extent of its dominions, by enumerating the countries which profess its doctrines, or which contain considerable communities under its obedience. In Europe, Italy, Spain, Portugal, France, Belgium, the Austrian empire, including Hungary, Bavaria, Poland, and the Rhenish provinces of Prussia, which formerly belonged to the ecclesiastical electorates, profess the Catholic religion as that of the state, or, according to the expression of the French *charte*, that of the majority of the people. In America, all the countries which once formed part of the Spanish dominions, both in the southern and northern portion of the continent, and which are now independent states, profess exclusively the same religion. The empire of Brazil is also Ca-

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* Under penance is included confession, as the Catholic sacrament of penance consists of three parts: contrition, [illegible] confession, and satisfaction.

† The clerical orders of [illegible] church are divided into two classes, *sacred* and *minor* orders. [illegible] consists of subdeacons, deacon[illegible] [illegible] are bound to celibacy and the daily recitation of the *Brevia*[illegible] psalms and prayers, occupying a considerable time. The minor [illegible] in number, and are preceded by the *tonsure*, an ecclesiastical [illegible] the hair is shorn, initiatory to the ecclesiastical state.

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tholic; Lower Canada and all those islands in the West Indies which belong to Spain or France, including the Republic of Haiti, profess the Catholic faith; and there are also considerable Catholic communities in the United States of North America, especially in Maryland and Louisiana. Many Indian tribes, in the Canadas, in the United States, in California, and in South America, have embraced the same faith. In Asia there is hardly any nation professing Christianity which does not contain large communities of Catholic Christians. Thus in Syria the entire nation or tribe of the Maronites, dispersed over Mount Libanus, are subjects of the Roman see, governed by a patriarch and bishops appointed by it. There are also other Syriac Christians under other bishops, united to the same see, who are dispersed all over Palestine and Syria. At Constantinople there is a Catholic Armenian patriarch who governs the *united* Armenians as th[illegible] called, large communities of whom also exist in Armenia proper. The Abbé Dubois, in his examination before a committee of the House of Commons in 1832, stated the number of Catholics in the Indian peninsula at 600,000, including Ceylon, and this number is perhaps rather underrated than otherwise. They are governed by four bishops and four vicars apostolic with episcopal consecration. A new one has just been added for Ceylon. We have not the means of ascertaining the number of Catholics in China, but in the province of Su-Chuen alone they were returned, 22nd September, 1824, at 47,487 (*Annales de la Propag. de la Foi*, No. xi[illegible]57); and an official report published at Rome in the same year gives those in the provinces of Fo-kien and Kiansi at 40,000. There are seven other provinces containing a considerable number of Catholics, of which we have no return. [illegible]) the united empire of Tonkin and Cochin-China the C[illegible]holics of one district were estimated at 200,000 (*Ibid.*, N[illegible], p. 191), and, till the late persecution, there was a colleg[illegible]th 200 students, and convents containing 700 religiou[illegible] Another district gave a return, in 1826, of 2955 infants baptized, which would give an estimate of 88,000 adult Christians. A third gave a return of 170,000. M. Dubois estimates the number of native Catholics in the Philippine islands at 2,000,000. In Africa, the islands of Mauritius and Bourbon are Catholic, and all the Portuguese settlements on the coasts, as well as the Azores, Madeira, the Cape Verd, and the Canary Islands.

CATHOLIC EPISTLES is the name given to the Epistles of the Apostles James, Peter, John, and Jude. They are called Catholic, i.e., 'universal,' according to the original meaning of [illegible], because they are addressed not to any particular ch[illegible] or nation, like the Epistles of St. Paul, but to the faithful in general then scattered about the world. St. James addresses his Epistle to the twelve tribes that are scattered abroad, meaning the converted Jews in Judæa and other Roman provinces. St. Peter addresses his first Epistle to the strangers scattered throughout Pontus, Galatia, Cappadocia, Asia, and Bithynia. St. John addresses the second of his Epistles to the elect lady and her children, meaning the universal church and its disciples; and Jude addresses his to the faithful in general.

CATILI'NA, LU'CIUS SE'RGIUS, descended from an illustrious patrician family, was born about B.C. 109. Catiline was quæstor about B.C. 77, and afterwards served as legatus to Scribonius Curio, proconsul of Macedonia, B.C. 75. He was prætor at Rome, B.C. 67. At the expiration of his prætorship, he obtained the province of Africa, which he left to canvass for the consulship: but he was obliged to give up his canvass in consequence of being accused of malversation in his province. During this year, B.C. 65, he formed a conspiracy with Cn. Piso and P. Autronius to assassinate the consuls and part of the senate. Suetonius says that Cæsar and M. Crassus were engaged in this plot, and that the latter was to be made dictator, and the former master of the horse. He cites as his authorities Tanusius Geminus, the edicts of Bibulus, the orations of the elder Curio, and Actorius Naso. (See also Cic. *in Catil.* 4.) The plot was frustrated at first by the backwardness of Crassus and Cæsar, and a second time by the hastiness of Catiline. Having procured an acquittal on his trial (B.C. 65) for maladministration in Africa by bribing the judices, and, it is said, the prosecutor also, P. Clodius, he was a candidate for the consulship with Cicero for the year B.C. 63. During the contest he was tried with many others for the murders which he had committed during the proscription of Sulla, to whose party Catiline belonged, and especially for that of Marius Gratidianus, uncle to Cicero, but, through the influence of the consular senators, he was acquitted. According to some, this murder, which was committed many years before, in addition to the imputed seduction of Fabia, Cicero's sister-in-law, laid the foundation for that animosity with which Cicero afterwards pursued Catiline. Yet Cicero says (*Ad Att.* i. [illegible] he had some thoughts of defending him on his trial for malversation.

In the beginning of June, B.C. 64, about a month before the consular election, urged by the ruined state of his fortunes, Catiline held the first meeting of his second conspiracy, eleven men of senatorian [illegible] of equestrian being present. Some rumour of [illegible] proceedings got abroad, and Catiline lost his election; while the previous preparations of Cicero prevented the execution of a design which Catiline had formed to kill the consul and other senators on the day of election. Notwithstanding this failure Catiline still pushed forward his designs with [illegible] vigour. Money and arms were collected, and Manlius, one of Sulla's veterans, only waited Catiline's orders to take the field with a large body of his comrades, who, after Sulla's victories, had been settled in different parts of Italy. Information of all their proceedings was conveyed to Cicero, and by him communicated to the senate, who, on the 21st October, issued the decree in the usual form, (Darent operam, &c.) which gave dictatorial power to the consuls. On the 6th November, another meeting of the conspirators was held, at which arrangements were made for firing the town and massacring the inhabitants, for the bringing up the Tuscan army under Manlius, and for the murder of Cicero, all which was reported the same evening to Cicero. Catiline still kept up the appearance of innocence, and though impeached by L. Paulus under the Plautian law, came down to the senate, which was assembled by Cicero on the 8th November. It was on this occasion that Cicero broke out into the celebrated invective, commencing 'Quousque tandem abutêre, Catilina, nostra patientia?' When he had concluded, Catiline, in an humble voice and manner, began to defend himself, but was interrupted by the senate calling out that 'he was an enemy and a traitor to his country.' Catiline abruptly left the senate-house, and set out the same night for the camp of Manlius, with the view of making some decisive movement before the consuls could get an army together to oppose him. The senate immediately declared him and Manlius enemies to the state, and ordered the consuls to raise new troops, of which the command was given to C. Antonius, the colleague of Cicero. Q. Marcius Rex and Q. Metellus Creticus were at this time waiting with their armies outside the gates for the honour of a triumph. It being reported that the slaves were arming in Apulia and Capua, Metellus was despatched into Apulia, and Marcius to Fæsulæ, where Manlius was encamped. A remonstrance, addressed to Marcius by Manlius, setting forth their grievances, was answered by a reference to the senate, but it does not appear that any engagement took place. Up to this time, Catiline made little progress, in consequence of his plans being regularly divulged, through the mistress of one of the conspirators, to Cicero, and his designs were consequently thwarted; while, on the other hand, the prospect of the conspiracy being crushed seemed equally distant.

A high reward which had been offered by the senate for information respecting the plot had produced no evidence, and it appears certain that a large proportion of the population (Sallust says the whole of the common people) approved of Catiline's design. But how far they were desirous of change from the hope of plunder, and how far from a well-grounded dissatisfaction with the government of the senatorian oligarchy, it would be a difficult matter to determine. The senate certainly did not appeal to the people for support against a common enemy. An unsuccessful attempt of the remaining conspirators to draw into the plot the ambassadors of the Allobroges, at that time in Rome, and to obtain from them a body of horse, furnished the consul with evidence against the principal conspirators. Lentulus, Gabinius, Statilius, and Cethegus were arrested. Fresh plots were now rumoured to be [illegible]ching among the dependents of the conspirators for their rescue; and after a long debate in the senate on the 5th December (Nonis Decembribus), in which Cæsar argued against, and Cato in favour of, the capital punishment of the conspirators, they were condemned to death without the form of a trial, and executed accordingly. Catiline now found himself hemmed in by Metellus Celer on the side of Cisalpine Gaul, and by Antonius, now proconsul, with a superior force among the Apennines. He made a desperate attack on the troops of Antonius, which were under the command of M. Petreius, was defeated, and fell among the thickest of the enemy, fighting bravely to the last, B.C. 62.

The history of Catiline's conspiracy is chiefly transmitted to us by Cicero and Sallust, and we have only one side of the story. Though there is doubtless great exaggeration in both these writers, and though it seems impossible to penetrate the whole design of Catiline, there is not much difficulty in forming a general opinion of this plot. The civil wars of Marius and Sulla, which terminated in favour of the latter party, led the way to an organized system of murder and plunder, of which few histories present so frightful an example. The partizans of Sulla were enriched by the proscription and robbery of their fellow citizens. This was the school in which Catiline and many of his accomplices were brought up. A body of profligate young men of rank, overwhelmed with debt, whose only pursuit is pleasure, are the readiest elements out of which to form a conspiracy. The conspiracy of Catiline was a conspiracy of an aristocratic faction against the body of which it formed a part; a body that had its own interested views and exclusive objects, but preferred accomplishing them in a more politic and less violent way. If the conspirators had succeeded, they would, as a matter of course, in following up the example of Sulla, have crushed the whole aristocratical party whose views were opposed to their own. The possession of all the influence in the state—the spoliation of their wealthy enemies, would have been the reward of the partizans of Catiline; but it is difficult to conceive that any one useful result to the state would have followed: and, in the absence of better evidence as to the character and abilities of the conspirators, it is impossible to conclude that Rome would have been fortunate enough to find among them a master who possessed the wisdom and moderation of the dictator Cæsar.

CATILLUS. [MARGARITACEA.]

CATKIN, in botany, is a kind of inflorescence which differs from the spike in nothing but its falling off the stem by an articulation, after its temporary office as the support of the organs of reproduction is accomplished. It occurs in the willow, the poplar, the birch, &c., which hence are sometimes called *Amentaceous* plants, amentum being the Latin name of the catkin.

CATMANDOO, the capital of the kingdom of Nepaul, in northern Hindustan, is situated in 27° 42′ N. lat., and 85° E. long., on the east bank of the river Bishenmutty. Catmandoo is the usual residence of the Ghorka Rajah, by whose predecessor Nepaul was conquered about the year 1765. Catmandoo stands upon the high ground that separates the sources of the rivers Gunduck and Cosi, and is at an elevation of 4784 feet above the level of the sea. The town is estimated to contain 5000 houses, and has a population of 20,000 souls; the streets are narrow and dirty, the houses are built of brick, and are three or four stories high; the whole, including the residence of the rajah, are mean in appearance. Catmandoo is an antient place, and is spoken of in old books under the name of Goongoolpatan.

CATO, *i. e.* the Wise, was a surname given to MARCUS PORCIUS PRISCUS. This extraordinary man, commonly called Cato Censorius or Cato Major, to distinguish him from his descendant who fell on his sword at Utica, was born in the year 234 B.C. He was descended from a respectable family in Tusculum, and passed his earlier years on a farm in the Sabine country, which he inherited from his father. At the age of seventeen a Roman necessarily became a soldier, and Cato's military career commenced in the very year when Hannibal was laying waste the North of Italy after the battle of the Trebia, 217 B.C. We find him afterwards serving under the command of Fabius, at the capture of Tarentum, in 209; and two years after he distinguished himself at the memorable battle on the banks of the Metaurus, which was fatal to the brother of Hannibal. In private life he maintained the same character for hardiness, industry, and sobriety which he had earned in the military profession. Occupying a farm adjoining that which had once belonged to Curius Dentatus, he seemed to take that old Roman for a model, and drew upon him the attention of the neighbouring farmers, not more by the simplicity of his habits than by the plain good sense of the laconic maxims which fell from his lips and became current in the neighbourhood. His singular reputation obtained him the name of Cato, and at length attracted the observation of a young Patrician, named L. Valerius Flaccus, who, looking upon him, to use the language of Plutarch, 'as a plant that deserved a better soil,' persuaded him to remove to Rome, and to offer himself for the public magistracies. With this friend, who thus introduced him to the Roman public, he afterwards held the highest posts in the state, the consulship and the censorship. The first [illegible] the series of Roman offices was the quæstorship. [illegible] he filled in 204 B.C., and was appointed to join the army in Sicily, which Scipio was about to carry across into Africa; but the profuse expenditure of the general offended those notions of strict economy which belonged to the character of Cato. The quæstor returned to Rome, and taking his seat in the senate, to which he was entitled by right of his office, he denounced the conduct of Scipio as fatal to the discipline of the army. Soon after we find him, according to Nepos, acting as quæstor in the island of Sardinia, where he became acquainted with Ennius. It is more probable that the acquaintance with Ennius was formed when Cato was in Sardinia as prætor. The errors of Nepos, or rather of the writer, whose works are ascribed to him, are innumerable. Cato, with all his rustic character, was a friend to literature, and it was he who first brought the Calabrian poet to Rome. After holding the plebeian ædileship and the prætorship, in the latter of which he was the governor of Sardinia, he finally arrived at the consulate, which he filled in 195, the year of Terence's birth, having his friend Valerius for his colleague. At that period of the Roman commonwealth it was usual for the consuls to hold commands at a distance from Rome. Cato was appointed governor of Nearer Spain, where the vigour of his arms and the policy of his counsels added greatly to the Roman influence, and procured him the honour of a triumph in the following year. He had now attained to the summit of military glory, but his zeal was not fatigued. The new consul, Tiberius Sempronius, being despatched on an expedition against the Thracians and the neighbourhood of the Danube, Cato accompanied him as one of his lieutenants.

When Antiochus invaded Greece, we find him again in military employment in the Peloponnesus, securing the fidelity of Corinth, Ægium, and Patræ; and in 191, by a bold movement, he dislodged Antiochus from the pass of Thermopylæ, and had the chief glory of the victory gained there by M'. Acilius Glabrio. In 184, the year in which Plautus died (it is useful to connect the life of Cato with the literature of his country), he was elected censor, and, as was before observed, with Valerius for his colleague. This censorship he made memorable in the annals of Roman history by the strictness with which he executed the important duties. He was now 50 years of age, and he continued for more than 30 years to take a prominent part in public life. But the unflinching determination with which he attacked the crimes and vices of the nobles called up many assailants upon himself. No Roman was ever a party to more public prosecutions, or had to defend himself against more. Even in his 81st year, he had to support himself against an accusation which had no foundation but the malice of his enemies, when he was led to say how cruel it was that, having passed his life with the men of one generation, he should have to defend it against those of another! But these attacks produced no effect upon his courage. When Sergius Galba had disgraced his country by the massacre of the Lusitanians after they had surrendered upon terms, and was brought to public trial at Rome, Cato again subscribed his name as one of the prosecutors, and took an active part in the proceedings. This trial was followed almost immediately by his death, at the age of 85, in the year 149 B.C. Thus as he entered active life soon after the invasion of Italy by Hannibal, so he just lived to see the commencement of the third Punic war, a war indeed into which the Romans were induced to enter chiefly by the urgent advice of Cato himself.

So far we have seen in him the successful soldier and the vigorous statesman. As an orator, an agriculturist, an historian, he was scarcely less celebrated. When yet living on his Sabine farm, he had been in the daily habit of appearing in the petty courts of the neighbourhood as the able advocate of his friends; afterwards at Rome he was one of the most distinguished orators in the forum; and as many as 150 of his orations were preserved and admired for many ages. As a writer on agriculture, he is still known by his work entitled 'De Re Rustica,' which, however, is certainly not in the form in which he wrote it. The language is not sufficiently antiquated for the age in which he lived; and besides this, there is abundant evidence that several parts of the work are lost, particularly the dedication to his son. The work, as we have it, consists of very brief directions for the management of a farm, and for economical housekeeping, from the buying of an estate to a charm for curing oxen and a receipt for cheesecakes. It is in this work that he lays down the principle, which excites the just indignation of Plutarch, the duty of selling off old oxen, old waggons, and old slaves. (§ 2.) Of his historical works but a few fragments remain. It was entitled 'Origines,' and, according to the life of Cato, which passes under the name of Cornelius Nepos, the first book treated of the Roman monarchy, the second and third of the origin of the chief cities of Italy, the fourth and fifth of the first and second Punic wars; the sixth and seventh continued the history down to the prætorship of Galba above mentioned. In the latter part of his history he enlarged upon his own achievements without any affectation of modesty. This history was written at the close of his life, so that Livy is guilty of an anachronism in making the tribune L. Valerius quote the 'Origines' against the author at the time when Cato was consul. (Liv. xxxiv. 5.)

Cato was twice married. By his first wife he had a son, Marcus, who married a daughter of L. Æmilius Paulus, the sister of the second Scipio Africanus, and died while prætor during his father's life-time. His second wife was Salonia, by whom he had a son, surnamed from his mother Saloninus. This son was the grandfather of Cato Uticensis. The character of Cato is boldly drawn by Livy in the 40th chapter of his 39th book. He was indeed, as Livy calls him, a man of iron body and iron soul, *ferrei prope corporis animique*. The chronology of the life of Cato is tolerably certain, notwithstanding the errors of Livy, Plutarch, Valerius Maximus, and Cornelius Nepos. See Clinton's *Fasti*. His historical fragments are printed at the end of Cort's Sallust; they have been also published by Krause, in his '[illegible] veterum Historicorum Romanorum,' Berolini, [illegible] and separately by Lion, under the title 'Catoniana,' Gott. 1826. The 'De Re Rustica' is found in Gesner's and in Schneider's collection of Latin works on that subject.

CATO, MARCUS PORCIUS, who was surnamed Uticensis (of Utica) from the place of his death, was the great-grandson of Cato the Censor, and born B.C. 93. He is said to have shown in early youth great powers of mind and firmness of character. When very young he was chosen to fill the office of priest of Apollo, and, that he might the better discharge the duties of his office, he determined to secure the instructions of a preceptor in morality. The character of his mind naturally [illegible] him to embrace the philosophy of the Porch, and he became a pupil of Antipater the Stoic. Inflexible decision, severity, and harshness appear to have been the prominent features of his mind; and the great privations and hardships to which he frequently subjected himself, such as abstaining from food, and making long journeys bareheaded and in all weathers, were calculated to strengthen these peculiarities. His half-brother Cæpio was lost at sea, on which occasion he is said to have relaxed the sternness of his spirit, and he who rarely laughed was then seen to weep. The body was cast ashore by the waves, and was buried by Cato with great honours.

Cato's military career commenced with his serving as a volunteer in the war of Spartacus, in which campaign he is said to have refused the distinctions with which Gallus, his commander, would have rewarded him. He afterwards went as a legionary tribune to Macedonia, and there presented a model of sobriety and courage. The designs of Metellus subsequently induced him to become a candidate for the office of tribune of the people. He was successful in his application, and gained by his conduct the general esteem of the public. Cato took part with Cicero against Catiline, and first gave him the title of *Pater Patriæ* (Father of his Fatherland): the speech which he made on this occasion respecting the punishment of the conspirators is preserved in Sallust (*Catil.*, c. 52). He vehemently opposed the union of Pompey, Crassus, and Cæsar, and, though threatened with banishment, fearlessly spoke against Cæsar's Agrarian law. Through the influence of Clodius he was sent to seize Cyprus, in the hope that he would destroy his own influence by failing in the enterprise; and, that he might be kept the longer away from Rome, he was ordered to go to Byzantium to settle the affairs of that town. On his return he was elected prætor, in which office he endeavoured, as far as possible to put a stop to bribery and corruption. At length, being unable to bring about a reconciliation between Cæsar and Pompey, he sided with the latter, and on the death of Pompey went over to Africa. Some dispute arising about the command of the troops in Africa, Cato resigned it to Q. Metellus Scipio, the father-in-law of Pompey; but he afterwards repented of this step, and wished that he had retained the command in compliance with the wishes of the army. Africa soon submitted to Cæsar, and the little that remained to oppose him was contained in the city of Utica. Cato encouraged his countrymen to stand a siege; but the approach of Cæsar alarmed them into submission. Upon this Cato advised his friends to save themselves by flight, and he even accompanied them to the port. Those who remained in Utica chose Lucius Cæsar to intercede for them with the conqueror, and Cato is said to have composed the speech which he was to make; but he would not allow his own name to be included in the petition. After an evening's meal, and a spirited conversation with some other philosophers, he withdrew to his chamber, and, after embracing his son and friends with unusual affection, he lay down and read a portion of Plato's *Phædon*, on the immortality of the soul. His son and friends in vain entreated him to desist from his resolution to commit suicide. He stabbed himself below the breast and died the same night. The inhabitants of Utica exhibited the utmost sorrow at the death of one whom they regarded as their benefactor and deliverer: nor did the approach of Cæsar prevent them from solemnising his funeral with the greatest pomp. When Cæsar heard of Cato's death, he is said to have exclaimed, 'Cato, I envy thee thy death, since thou hast envied me the glory of saving thy life!' He died, according to some, in the 48th, and according to others in the 59th, year of his age. (Plutarch's *Life of Cato*; Cicero, *de Offic.* i. 31; Sallust, *Catil.* cc. 52 54; Valer. Maxim. ii. 10. 7; Aul. Gell. iv. 10; Horat. *Od.* i. 12. 35, ii. 1, 24; Lucan, i. 128; Virg. *Æn.* vi. 841, viii. 670; Juven. xi. 90.)

Coin of Cato.

[British Museum. Actual size. Silver. 60 grains.]

CATOPHRAGMUS. [CIRRIPEDA.]

CATOPTRICS. [OPTICS.]

CATOPTROPHORUS. [TOTANUS.]

CATS, JACOB, a very eminent Dutch poet, whose writings were for a long period far more popular than those of any of their authors among his countrymen, was born at Brouwershaven, in Zealand, November 10th, 1577. His mother dying while he was very young, and his father marrying again, he was taken in charge by a maternal uncle, who spared no cost on his education; but his progress in his earlier studies was by no means such as to give earnest of what he would afterwards perform, although he took great delight in reading poetry for his amusement. At Leyden he went through a course of jurisprudence, and made some proficiency in Greek, but never attained to any great acquaintance with Greek literature, a deficiency which, in his more advanced life, he greatly regretted. On quitting Leyden, he proceeded to Orleans, where he took the degree of doctor of laws; and he remained some time in France, both in order to perfect himself in the language and for the purpose of enjoying a tone of society in comparison with which he felt that of his own countrymen to be cold and unpolished. On his return home, he first practised as advocate in Brouwershaven, where his agreeable address and quickness soon obtained for him considerable repute in his profession. Being attacked, however, with an obstinate tertian fever, he was advised to try the effects of travelling and change of air, on which he visited England, but reaped no other advantage from his journey than an acquaintance with the language, and what he derived from the studies he pursued at both Oxford and Cambridge. At length, after having in vain sought relief from all the medical men whom he consulted, he recovered his health by means of a powder given him by an old alchemist. He now removed to Middleburg, where he married a lady named Valkenburg, by whom he had five children. It was during this part of his life—the one which he afterwards, amid the toils and dignities of office, acknowledged to have been by far the most enviable portion of it—that he produced his 'Emblems,' and 'Spiegel van den Ouden en Nieuwen Tijd.' But the war which broke out in 1621 compelled him to quit Middleburg and go to reside at the Hague. After being made pensionary of Dordrecht, in 1625, he was dispatched on an embassy to England in 1627, when he was knighted by Charles I. About nine years later, he was elevated to the dignity of pensionary of Holland, which he retained till 1651, and in the following year again came over to England on an embassy to Cromwell, although he would fain have excused himself from the honour, and was ultimately obliged to return without having effected any of the objects of his mission. This was the close of his public life; and he was now permitted to enjoy, in his rural retreat at Zorgvliet, near the Hague, that tranquillity and leisure after which he had long sighed. It was here that at an age exceeding threescore and ten by several years, he resumed his literary and poetical pursuits, and composed his 'Buitenleven' (Country Life), and numerous other productions, constituting the principal bulk of his works. Thus usefully as well as innocently employed, he continued to enjoy life, while he looked forward to death without apprehension, till he expired calmly, September 12th, 1660, shortly before he completed his 83rd year.

Cats' popularity with his countrymen, by whom he is familiarly yet affectionately styled Vader Cats, was derived from more sterling merits than usually accompany more brilliant genius. His works may be regarded as a fund of moral instruction for all ranks and ages, and as a vast store-house of didactic precepts and examples applicable to almost all the varying circumstances of life. His muse never takes any elevated flights; on the contrary, his poetical style, always plain and familiar, occasionally borders on the homely and colloquial, but most of his poems being in the form of dialogue, such a style is not only excusable but appropriate, nor does it ever sink into the mean and vulgar. It is for the most part marked by a naïveté of thought and expression, and by a simplicity, which are becoming and agreeable enough. Like his diction, his versification is easy though rather monotonous, and appears to have flowed from his pen without effort; and he certainly did much towards refining and improving his native tongue, imparting to it greater freedom and pliancy. He frequently exhibits likewise striking originality and felicity of ideas. But with him manner was only secondary and subsidiary to matter; his aim was not so much to shine as to instruct, and it is in the character of a moral teacher that he is chiefly to be viewed. His lessons are those of practical wisdom and virtue, not lofty speculations too subtle and refined to influence men's conduct, but instructions applicable to the daily concerns of life. He addressed himself to the many, and there can be no doubt that his works have been largely influential for good, and all the better calculated to attain their end by combining entertainment with moral instruction. Numerous anecdotes and historical illustrations are introduced. At the same time he is not exempt from the charge of prolixity and excess, occasioned by his copiousness. At the present day, both his language and manner have become somewhat antiquated; and accordingly he is now more praised than read.

CATSKILL MOUNTAINS. [Appalachian Mountains, i. 178.]

CATTARO. [Dalmatia.]

CATTEGAT, or KATTEGAT. [Baltic.]

CATTI, a people of Old Germany, who lived between the Rhine and the Visurgis (Weser) as far east as the borders of the Hercynian forest. Tacitus (*German.*, 30) describes them as a fierce, hardy, robust race, skilful in their mode of warfare, which partook more of the character of a regular campaign than of that of the predatory incursions of other German tribes. Unlike other German nations, whose chief strength lay in their cavalry, the Catti fought chiefly on foot. The Batavi were a tribe of the Catti, who left their native grounds on account of some domestic differences, and settled in the islands at the mouth of the Rhine. [Batavi.] The Catti, with the Cherusci, Tencteri, and others, fought against Drusus, who defeated them; but some years after they defeated Varus and destroyed his legions. In the reign of Tiberius, Germanicus, the [illegible] of Drusus, attacked the Catti with a large force, overran the country, and made a slaughter of them, sparing neither the women nor the len. (Tacitus, *Annal.* i. 55.) The Catti however continued in arms against the Romans for a long time after, and we find them under Vitellius aiding the revolt of Civilis the Batavian chief. They afterwards quarrelled with their neighbours the Hermunduri, by whom they were nearly exterminated. (*Annal.* xiii. 57.)

CATTLE. In its most extensive sense the word cattle denotes all the larger domestic quadrupeds, which are used for draught or food. In the usual acceptation of the word it is confined to the [illegible] or what is called black cattle or horned cattle. But as many varieties are not black, and several have no horns, the name of *neat cattle* is more appropriate. The rearing and feeding of cattle is a very important branch of agricultural industry. Much of the success of a farmer depends on the judicious management of live stock, without which his land cannot be maintained in a proper state of fertility. The breeding and fattening of cattle are generally distinct occupations. It is of the greatest importance to the breeder, as well as to the grazier, to ascertain the qualities of each different breed of cattle; to determine which is best suited to his purpose, and which will bring him the greatest profit.

The domestic bull and cow are probably of Asiatic origin. In those countries where they are now found in a wild state, they are evidently descended from domestic animals which have been let loose, or have strayed from the habitations of man. The *Urus*, which ranged wild in the Hercynian Forest, and was a dangerous enemy to those who encountered him, appears to have differed little from the common bull. If he was an indigenous wild animal, he was perhaps the original stock from which our different European varieties sprung, modified by climate and difference of pasture. This however is denied by naturalists, who consider him a distinct species. [Bison.] The small Hindoo ox with a hump on the chine, and the African Cape ox, which is used for riding as well as draught, and has no hump, are both more nearly allied to the buffalo. They are very tame, and more intelligent than the generality of our oxen, owing probably to their being more nearly associated with their masters. Of the cattle on the Continent of Europe, one of the principal breeds is the Polish or Ukraine. The oxen of this breed are large and strong, and fatten readily in good pastures. Their flesh is succulent and well tasted; but the cows do not readily allow themselves to be milked, and consequently are not fit for the dairy. The colour is generally a light grey, seldom either black or white. They are docile when worked; but are not considered so hardy and strong as the Hungarian oxen, which resemble them in colour, but are more compact, and have shorter limbs. The horns are large and spreading, which gives them a formidable appearance, and compared with the more improved and carefully bred cattle, they are heavy and course. When they are stalled in winter on hay and roots, they bring a considerable profit by fattening very soon. They are driven in herds from the extensive plains in which they are bred, and sold to graziers in the adjoining districts of Germany.

In the plains of Jutland, Holstein, and Schleswig, there is a very fine breed, with small short crooked horns, which appears to be nearly allied to the Friesland and to our own Holderness breed. They are of various colours; but mouse or fawn colour, interspersed with white, are the most common. Red cows of this breed are seldom seen. They are good milkers in moderate pastures, and the oxen fatten readily when grazed or stall-fed at a proper age. They are fine in the horn and bone, and wide in the loins; but they are not considered so hardy and strong for labour as the preceding breed. If prejudice did not make the breeders select the calves with large bone and coarse features to rear as bulls, in preference to those which resemble the cows, this breed would in every respect equal our best short-horns. The cows are frequently fattened while still in milk, and are fit for the butcher by the time they are dry; the same system is followed by the great milkmen in the neighbourhood of London, with their large Holderness cows. This breed is much esteemed in all the northern parts of Europe. The Friesland, Oldenburg, Dantzig, and Tilsit cattle, are mostly varieties of this short-horned breed.

Towards the Alps the cattle have a different character; they are strong and active, and can range wider in search of pasture. The largest and finest breed is the Swiss, especially the Freyburg race, which is found in the rich pastures between the mountains in the neighbourhood of Greyerz (Gruyères), a place well known for its excellent cheese which is consumed all over Europe. The cows, which are here the principal object of attention, are large and wide in the flanks, and strong in the horn—(we should rank them in England among the middle horns)—short and strong in the bone, with a prominence at the root of the tail, which, according to our notions, would be considered a great blemish. They give abundance of rich milk when ranging in their native Alps, or when stalled and fed with clover or lucern in the stables. The oxen work well, but are rather heavy and slow. When fed off they fatten well; and although fat meat is not much prized there, some carcases may be seen slaughtered in Bern and Freyburg which are equal to those in the best English markets.

There is a smaller, but very active mountain breed of cattle in the Jura, which does well on scanty food. The cows are small and slight, generally of a light red colour. The oxen are very active and strong for their size. They draw invariably by the horns. They are not considered so profitable for stall feeding as the larger, but they are excellent for the small cottagers on the borders of the mountains, and find their sustenance among the woods and rocks, where they climb like goats.

The Norman breed gives the character to all the cattle usually met with in the northern part of France, except near the Rhine. They are mostly of a light red colour, sometimes spotted with white. Their horns are short, and stand well out from the forehead, turning up with a black tip; the legs fine and slender; the [illegible] high, and the thighs thin. The cows are good milkers, and the milk is rich. They are in general extremely lean, which is owing in a great measure to the scanty food they gather by the sides of roads, and along the grass balks which divide the fields. In Normandy itself they have good pastures, and the cattle are larger and look better. The Alderney and Jersey breeds, which from the extreme richness of their milk are much prized in gentlemen's dairies in England, are smaller varieties of the Norman, with shorter horns, more turned in, and a still more deer-like form.

The Italian breeds are not very remarkable, except from the immense length of the horns of some of them. No great pains are taken to improve them, except in some parts of the north of Italy, where the Parmesan cheese is manufactured: there they resemble the Swiss breed, and are probably only varieties of the same stock.

The different British and Irish breeds have been generally distinguished from each other by the length of the horn. The long horned breed is supposed by many to be indigenous. Others consider the middle horned as the old breed. The former was chiefly found in a district of Yorkshire called Craven, and was greatly improved by the skill of Robert Bakewell, of Dishley Farm, in Leicestershire, and hence they are called the Dishley breed. The distinguishing character of this breed are long horns growing downwards from the side of the head and ending in straight points parallel to the jaw. In order to give an adequate idea of the qualities of this improved breed, we must consider what breeders and graziers call the fine *points* of an ox. These are certain forms and appearances, which are either anatomically connected with a perfect conformation of the body, and especially of the organs of respiration and of digestion, or which are constantly associated with the peculiar qualities of certain breeds, so as to be proofs of their purity. Of the first kind are a wide chest, well formed barrel, strong and straight spine, hip bones well separated, and length of quarter, all which can be proved to be essential to the perfect functions of the body. Small and short bones in the legs give firmness without unnecessary weight. A thick skin well covered with hair insures proper warmth, and its soft loose feel indicates a good coat of cellular substance underneath, which will readily be filled with deposited fat. All these are indispensable points in an ox which is to be profitably fatted, and whatever be the breed, they will always indicate superiority. Other points, such as colour, form of the horns, shape of the jaw, and setting on of the tail, with other particulars, are only essential in so far as experience has observed them in the best breeds, and as they are indications of pure blood. The eye is of great importance; it should be lively and mild, indicating a healthy circulation, with a gentle and almost indolent temper. An animal that is not easily disturbed will fatten rapidly, while one that is restless and impatient will never acquire flesh. Amongst the antients, a deep dewlap was considered as a great beauty in an ox. In some of our best breeds there is scarcely any. The rump of the Freyburg cows, as we observed before, rises high towards the tail; while a straight back from the neck to the tail is indispensable in a well-bred British ox.

Having established a breed which has many superior qualities, attention is paid to maintain its purity: and to those who cannot ascertain the parentage, certain marks are satisfactory proof of purity of blood. The new Leicester long-horn oxen were noted for the smallness of the bone and their aptitude to fatten. Their flesh was fine-grained, the fat being well intermixed in the muscles. At the time when Bakewell died, about 1795, no other breed could be brought into competition with his improved long-horns. But whether his successors have not paid the same attention to keep up the qualities of the breed, or it has degenerated in comparison, they have since lost much of their reputation, and the short-horned breed has now the superiority. Good long-horned cattle are, however, occasionally seen in the midland counties. One defect of the breed was, that the cows gave but little milk, and this may be the reason for now preferring the short-horns. The Teeswater or Holderness breed of cattle was produced by the importation of cows from Holstein or Holland, and careful breeding and crossing. They now much excel the original stock. The principal improver of the Teeswater breed was Mr. Charles Collins. By his care a breed has been produced which is unrivalled for the dairy, and for fattening readily. Almost every good breed now in existence traces its pedigree to his bulls, especially one of the first he used, called *Hubback*. The famous ox exhibited thirty years ago, under the name of the Durham ox, was of this breed. By careful crossing with a Galloway cow, an improved breed was produced, which was in such repute that at a sale of Mr. Collins's stock of short-horns, October 11, 1810, a famous bull, called Comet, sold for 1000 guineas, and 48 lots of bulls, cows, and calves realized 7115*l*. 17*s*. (*Library of Useful Knowledge*, 'Cattle,' p. 233.) The short-horn cattle are mostly light coloured, some quite white, but most are speckled with red and white, without any large distinct spots. The horns are very short. In the cow, the points turn inwards towards each other. Some of the finest bulls have merely a tip of a horn standing out from each side of the forehead. In the carcase they have every point which we have before enumerated as essential to perfection.

Besides the two breeds above mentioned, there are several in great repute in particular districts, which almost dispute the superiority with the short-horns. Of these the Devonshire breed is the handsomest. The colour of this breed is invariably red, with a very fine head, small bone, and glossy hide. The oxen, although not so heavy as some, are the best for the plough on light lands: they walk nearly as fast as horses, and will work almost as well in pairs. The cows are good milkers, any deficiency in quantity being made up by the richness of the cream. The oxen fatten readily, and their flesh is of the best quality.

The Sussex breed is only distinguished from the Devon by being rather stronger, and not so fine in the head and horn.

The Herefordshire breed is larger and heavier than either of the preceding, the horns longer and more turned outwards; the colour is red, but the belly and the face are generally white, and there is often a white stripe along the back. This breed has many excellent qualities, and fattens well; but the cows are of little use for the dairy, from the small quantity of milk they yield. The Herefordshire oxen are best suited to the rich pastures of their native county, where they grow to a great size and increase fast. These are the principal English breeds. Of the Welsh breeds, the Glamorganshire cows are in good repute for the dairy; they are of a dark brown colour with a white stripe along the back, long white horns pointing rather forwards and upwards; the tail is set on rather high above the back, which is thought a defect, but in this they are much exceeded by the Freyburg cows mentioned above, which have great merit notwithstanding. The other Welsh breeds are distinguished chiefly by their hardy constitutions, which they owe to their having been bred in mountainous districts. Great droves of them come to all the English fairs; their low price and small expense of keep render them an object worthy the attention of cottagers and small farmers; they are best calculated to [illegible] rough heaths and commons.

The principal indigenous Scotch breeds are the West Highland, the Galloway, the Angus, and the Shetland.

There is a doubt whether the Ayrshire should be classed amongst the pure Scotch cattle. Their great resemblance to the short-horn in all but the size leads one to suppose that they are a cross of a smaller breed by a short-horn bull, but they have very good qualities, and are excellent for the dairy or for stalling.

A great many cattle are bred in the various islands which lie on the western coast of Scotland. They are mostly of a small black breed, called Kyloes. They are very hardy, and when brought into good pasture, fatten rapidly and produce the finest and best flavoured beef. They are found in the greatest perfection in the Isle of Skye, and are sent annually in large droves from their native islands, and dispersed through Scotland and England. They are particularly in request in Norfolk, Suffolk, and Essex, where they are wintered on turnips, and sent to Smithfield in the spring and summer following. If they do not produce so great a weight of beef as many other breeds, they always bring the highest price in the market, and require but a very short time to get fat. The Galloway is a peculiar breed, which has many good qualities: it has no horns; the body is compact, and the legs short; and few breeds can vie with the Galloway oxen and heifers in aptitude to fatten. There is a peculiar roundness in all the parts of the body, which makes the animal look well in flesh, even when he is lean. The skin is loose, and the hair soft and silky to the touch. They are mostly black, but some are of a dun colour, which shows a connection between this breed and the polled Suffolk. It is only the colour which distinguishes them. Many of the Galloway heifers are spayed, and get very fat at an early age. The Galloway cows are not very good milkers, in which respect they differ from the Suffolk, but their milk is very rich.

The *Angus doddie* is also a polled breed, and has been long in repute. It is probably a variety of the Galloway, to which it bears a strong resemblance, but it has been found in Angus from time immemorial.

The Shetland cattle are very diminutive and coarsely shaped, but their flesh is reckoned well flavoured. They are seldom driven into England or the South of Scotland, because when fat they attain but a very small weight. The breed is, however, worth the notice of experimental agriculturists.

The Aberdeenshire and Fifeshire breeds are horned, and have been produced by various crosses with short-horns and other English breeds. All the Scotch breeds have been greatly improved by the premiums given by the Highland Society for the encouragement of breeding.

Of Irish cattle, the small Kerry cow seems to be purely native. It is a useful breed for cottagers, requiring but moderate keep and care, and giving a considerable quantity of milk in proportion to the size of the animal and the food it requires.

The best Irish cattle are produced by crosses with the improved Leicester long-horns, and in the rich pastures of the south many fine animals were reared and slaughtered for the use of the navy during the war.

These are the principal breeds of cattle in the United Kingdom. By selecting those which are best suited to each situation and pasture, the industrious farmer may add considerably to his profits, and at the same time enrich his land with the manure. In purchasing cattle it is very necessary that the age should be readily ascertained: the surest mode of doing this is by examining the teeth. A calf has usually two front teeth when he is dropped, or they will appear a day or two after his birth; in a fortnight he will have four, in three weeks six, and at the end of a month eight. After this, these milk-teeth, as they are called, gradually wear and fall out, and are replaced by the second and permanent teeth. At two years old the two middle teeth are replaced; the next year there will be four new teeth in all: at four years there are six permanent teeth, and at five the whole eight are replaced. The milk-teeth do not always fall out, but are sometimes only pushed back by the second set: and in this case they should be removed with an instrument, as they impede mastication and irritate the mouth. After six years old the edges of the teeth begin to wear flat, and as they wear off the root of the tooth is pushed up in the socket, and the width of the teeth is diminished, leaving interstices between them: this begins in the middle teeth and extends gradually to the corners. At ten years old the four middle teeth are considerably diminished, and the mark worn out of them. After fifteen years of age few cows can keep themselves in condition by pasturing; but they may continue to give milk, or be fattened by stalling and giving them ground food. Horned cattle have rings at the root of the horns, by which the age may also be known. The first ring appears at three years of age, and a new one is formed between it and the skull every year after. But this mode of ascertaining the age is not so sure as by the teeth, deception being much easier by filing off the rings.

In order to learn by experience what breed of cattle is most profitable, it is very advantageous to weigh them occasionally and note their increase. For this purpose several [illegible]ple and ingenious weighing machines have been in[illegible]d. For want of better, a strong kind of steel-yard may be made of a young fir tree about twenty feet long, suspended from a strong beam by a hook fixed about a foot from the thickest end, to which is attached another hook, from which descend strong flat hempen bands, forming two loops joined together by iron rings. These are put under the belly and chest of an ox; and a weight hung at the smaller end of the pole, just sufficient to lift him off his legs, readily gives his live weight. Experience has shown the proportion between the saleable quarters and the offal, in different states of fatness; and tables have been constructed by which the net weight is found by mere inspection. Multiplying the live weight by 0·605, gives a near approximation to the neat dead weight in an ox moderately fat and of a good breed. When an ox is fat, his weight may be very nearly guessed by measuring his girth immediately behind the fore legs, and the length from the tip of the shoulder to the perpendicular line which touches the hinder parts, or to a wall against which the animal is backed. The square of the girth in inches and decimals is multiplied by the length, and the product multiplied by the decimal ·238. This gives the weight of the four quarters in stones of 14 lbs. This rule is founded on the supposition, that there is a certain proportion between the net weight of the quarters and that of a cylinder the circumference of which is the girth, and the axis the length taken as above. The proportion has been ascertained by observation and repeated comparison.[*] The measurement will at all events indicate the proportional increase during the period of fattening.

Cattle are not subject to many diseases, if they have plenty of food and good water, and are kept clean. Air is essential to them, and although cows will give more milk, and oxen will fatten better when kept in warm stalls in winter, they are both less subject to diseases when they are kept in open yards, with merely a shelter from the snow and rain. Epizootic diseases, which sometimes ravage whole districts, are less known in England than in most countries. For the peculiar diseases of cattle see Ox and Cow.

The most economical mode of feeding cattle is evidently by allowing them to seek their food on commons and uncultivated pastures; but it is only in particular situations that it is the most advantageous. Cattle fed on commons add little to the stock of manure, except when they are kept in the yards or stalls in winter: even then their dung is of little value, if they are merely kept alive on straw or coarse hay, as is generally the case where the stock is kept on commons or mountains in summer. When they feed in inclosed and rich pastures, their dung falling in heaps on the grass does more harm than good. The urine fertilizes the soil in wet weather when it is diluted; but in dry weather it only burns up the grass. If we calculate what would be the amount of dung collected if the cattle were kept in yards or stables, and fed with food cut for them and brought there, and also the loss of grass by treading on the pastures, we shall have no doubt whether the additional labour of cutting the grass and bringing it home daily is not amply repaid by the saving. But if we also take into the account the variety of artificial grasses, pulse, and roots which may be grown with advantage on land unfit for permanent grass, and the quantity of arable land which may thus be kept in the highest state of cultivation, we shall be convinced that the practice of those countries where the cattle are constantly kept at home is well worthy of imitation. It may be of use to the health of the animals to be allowed to take a few hours' air and exercise in a pasture near the stable; but there is no advantage in their having any grass crop there: on the contrary, the barer of grass the surface is, the better. They will relish their food better when they are taken in after a few hours' fasting. A bite of fresh short grass might, on the contrary, give them a dislike to their staler food. When cut grass is given to cattle in the stalls, it is best to let it lie in a heap for at least twelve hours before it is given to them. It heats slightly, and the peculiar odour of some of the plants, which oxen and cows are not fond of, being mixed with that of the more fragrant, the whole is eaten without waste. Experience has shown that many plants which cattle refuse in the field, where they have a choice, have nutritious qualities when eaten mixed with others in the form of hay. There are few deleterious plants in good grass land or water meadows, and these are readily distinguished and weeded out. The quantity and quality of the dung of cattle stalled and well fed is so remarkable, that its value makes a considerable deduction from that of the food given; especially of green food, such as clover, lucern, tares, and every kind of leguminous plant: we shall not be far wrong, if we set it at one-fourth. This supposes a sufficient quantity of straw for litter, and an economical collection of the liquid parts in proper reservoirs or tanks. In order to make the feeding of cattle advantageous, the buildings must be conveniently placed with respect to the fields from which the food is to be brought. Moveable sheds with temporary yards, which can be erected in different parts of a large farm, according as different fields are in grass or roots, are a great saving of carriage, both in the bringing the food to the cattle and carrying the dung on the land. A clay bottom should be selected, in a dry and rather high spot, if possible. But if permanent buildings for cattle, constructed of rough materials and thatched with straw, were erected in the centre of about forty acres of arable land, in different parts of a large farm, it would probably be a great saving in the end.

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[*] If g be the girth and l the length taken as above, a the area of a circle whose circumference is unity, then $lg^2 a$ = cylinder; and if the proportion of this cylinder has been found by repeated trials to be to the weight of the carcase in stones of 14 lb. as $b : 1$, then $lg^2 \times \frac{a}{b}$ is the net weight. In this case $\frac{a}{b}$ has been found $= 0·238$. $\therefore lg^2 \times 0·238$ is the weight.

Good water is most essential to the health of cattle, and that which has been some time exposed to the air seems the best for them. When they are fatted in stalls on dry food, they should always have a trough of water within reach. A piece of rock-salt to lick, or some salt given with their food, is highly conducive to their health, and will restore their appetite when it begins to flag. Rubbing the hide with a wisp of straw or a strong brush, as is done to horses, may appear a useless labour, but it is well known that there is no better substitute for that exercise which is essential to health. Where labour is not regarded, as is always the case when the owner of the cattle attends upon them himself, the curry-comb and the brush are in regular use, and the advantage is not denied.

In those countries where the farmer is allowed to distil a spirit from his grain, it is a great advantage to an agricultural establishment to have a distillery attached to it, especially in a remote situation; and not only is the fattening of cattle on the refuse of the distillation a source of profit, but the manure extends fertility around. The produce in spirits and in cattle is easily transported to a great distance, and almost the whole of what is produced by the land returns to it in the shape of manure. The same may be said of the manufactory of sugar from beet root, which has been lately so much extended in the north of France.

It can never be too much impressed upon the minds of agriculturists, that without dung there is no corn; without cattle there is no dung. Every means should therefore be used to encourage the breeding and feeding of cattle, and none can be more effectual than to show that the profits of a farm are always proportioned to the quantity of cattle kept, and the abundance of the food provided for them.

CATTYWAR, or **KATTYWAR**, a district occupying a portion of the interior of the Gujerat peninsula, bounded on the N. by Jhallawar, on the E. by Goelwara, on the S. by Babreeawar, and on the W. by Soret. The surface towards the N. is irregular, and in the S. is jungly. The soil is variable, but sand prevails on the plains, where it is mixed with reddish-coloured rock, of which the hills are mainly composed. These hills are deficient in trees. The more usual kinds of produce are wheat and a few coarser grains. Many horses are reared, the breed being considered among the best in India. The inhabitants, who are not numerous, are known by the name of Catties. Female infanticide is very common in the country; among the higher classes indeed it is nearly universal, notwithstanding the provisions of a treaty concluded with them by the British in 1807, which stipulated for the abolition of the custom. their wives are consequently often procured from neighbouring districts. The Catties are allowed to marry any number of wives, but few persons take more than two. The men are an athletic race, and such of the women as are allowed to live, grow up with a considerable share of personal beauty. The Catties are worshippers of the sun. The men are robbers by profession, and attach no idea of criminality to thieving.

The country is divided among numerous tributary chiefs and princes, each exercising independent power within the limits of his own division. Some of these chiefs are under the direct authority of the British, but the greater number are subject to the Guicowar, although these too are placed under the control and management of the Company's officers, by whom the tribute is collected and accounted for to the Guicowar. This arrangement has been found necessary in order to preserve peace in the country. The interference of the British extends sometimes to criminal as well as financial matters. The commissioner of Guzerat visits Cattywar twice in the year, and aided by the Company's political agent and three or four native chiefs as assessors, presides at the trial of persons charged with the commission of capital offences, such as robbery and murder, in the territories of petty states, the chiefs of which are too weak to bring them to punishment. All the rights which the British possess in Cattywar have been acquired from the Peishwa and the Guicowar; from the former by conquest, from the latter by mutual arrangement. Those rights have been considered as limited to the collection of tribute and the preservation of peace; in other respects the Cattywar chieftains have been left to the uncontrolled exercise of all the functions of government within their own immediate territories. Some of the principalities are of considerable extent, but others are of petty dimensions, and one chief is named—the Rana of Purchree,—whose tribute amounts to only 21 rupees per annum. In 1820 there were 137 chiefs directly tributary to the British government.

(*Report of Committee of House of Commons in* 1832 *on the Affairs of India*—political division.)

CATULLUS, CAIUS VALE'RIUS, sometimes, but erroneously, called **QUINTUS VALERIUS CATULLUS**, was born at Verona, B.C. 87, about 17 years before Virgil and 22 before Horace. His father Valerius was of a respectable municipal family in that city, and lived in habits of intimacy with C. Julius Cæsar, who appears, when his affairs led him to visit or pass through Cisalpine Gaul, to have taken up his abode at the house of Valerius. Catullus left his paternal roof at an early age for Rome, where he plunged into dissipation and extravagance, mortgaged his estate, and fell into great poverty. His pecuniary misfortunes do not seem to have broken his spirit or abated his good humour. He laughs off his mortgage with a pun, and jokes on his poverty with the utmost indifference. However, to improve his fortune he, together with his brother, accompanied the prætor Memmius (the same to whom Lucretius dedicated his immortal poem) to Bithynia. This expedition, as respects the object our poet had in view, was completely unsuccessful. He returned as poor as he went, and on his voyage home had the additional misfortune to lose his brother, to whom he was affectionately attached, and who died on the coast of Troy. The death of his brother he deplores on more than one occasion in his works with great pathos, and in a style of natural and genuine feeling. The voyage from Bithynia homewards was perfomed by sea in a small open pinnace, called a phaselus, an undertaking which strongly shows the poet's courage and perseverance. A voyage of that length, from its commencement in the Euxine to its termination on the shores of the lake Benacus, in so fragile a bark, satisfactorily proves that Catullus was not deficient in at least one Roman virtue,—a contempt of danger. He concluded this arduous enterprise by ascending the Po, and finally by the Mincius reached the promontory of Sirmio on Lake Benacus. On this promontory, where he appears to have possessed some property, he dedicated his little bark to Castor and Pollux in some verses which have been much admired. From the time of his return from Bithynia he continued to reside mostly at Rome, pursuing his pleasures, though living, as we collect from his writings, in poverty. From the same source we derive the information that he possessed estates [illegible] the Sabine country and at Sirmio, probably of little value.

His chief or only patron was Manlius Torquatus, on whose marriage with Julia he wrote his 'Carmen Nuptiale.' Notwithstanding his poverty he lived in intimacy with all the men of talent of his day, among whom were Cicero, Cornelius Nepos, Licinius Calvus the orator, Asinius Pollio, Varus, Cornificius, Cœlius of Verona, Hortalus, Cæcilius, and others. Cicero is supposed by some to have pleaded a cause for him; good critics however deny or doubt the fact. Judging from his writings and the freedom with which he indulges in satire, without regard to the rank, power, or wealth of the object of it, we may fairly pronounce that Catullus possessed a lofty, independent spirit. His boldest flight was against Julius Cæsar, even in the plenitude of his power. He lashed his shameless extravagance and his odious partiality for Mamurra with unsparing severity. For this however he afterwards apologised; and the generous conqueror invited the poet to his table on the same day, and still continued his intercourse with his father Valerius.

Of all the poet's favourites, Clodia, who appears under the feigned name of Lesbia, seems to have enjoyed the greatest share of his affection and of the effusions of his muse. His lines on the death of Lesbia's sparrow are perhaps as well known and as often quoted or alluded to as any verses he ever wrote. In his day Catullus bore the character of a learned person, and the epithet 'doctus' is frequently applied to his name in the various testimonials which have reached us of his fame and merits. This he perhaps obtained from his knowledge of the Greek language, and from the translations he made of some of the odes of Sappho and the poems of Callimachus.

A considerable part of the writings of Catullus is supposed to be lost. He died, according to some, at the age of 40 or thereabouts: according to others he attained the advanced age of 71. The latter opinion is combated at great length, and very successfully, by Bayle in his 'Historical and Critical Dictionary.' The concurrent testimony of all the men of wit and learning of his own and after times establishes his character as a man of first-rate talents and a true poet. He possessed a brilliant imagination, and clothed his thoughts in the best language. His style is easy and unaffected; he is always free from conceit or bombast; his lines are full of sweetness and harmony. In his playful moods he has many touches of humour, and is always entertaining and agreeable. When pathetic, his feelings are natural and unrestrained. Many of his thoughts have been borrowed by subsequent writers. He fell into the vice of his age, and several of his pieces are degraded by the most obscene ideas couched in the most revolting expressions. The only palliation for this offence that can be offered is the manners of the times, when the grossest violations of propriety were overlooked, if not encouraged, by those whose power, wealth, and influence enabled them to set the fashion.

His longest and most beautiful poem is the 'Epithalamium of Peleus and Thetis.' It has been objected to this piece that the author, immediately after its commencement, digresses into an episode longer than all the rest of the poem, being a narrative of the desertion of Ariadne by Theseus on the shores of Naxos, and having no reference to or connexion with the main story, into which it is introduced as a description of the embroidery on the garment of Thetis. To this criticism, which applies to the plan and not to the execution of the poem, it may be observed, that what editors and commentators have thought fit to call the 'Epithalamium' of Peleus and Thetis, is possibly only part of a longer and unfinished work, intended by the author to bear a different designation, or it is only the fragment of the entire work which has come down to us. However that may be, the sufferings of Ariadne, and her desertion of her father's house, form a fine contrast with the chaste loves and the happy marriage of the parents of Achilles, and her story may have been selected by the poet with a view to produce that effect.

The poems of Catullus are said to have been unknown to the moderns till the beginning of the 15th century, and that it was only about A.D. 1425 that a copy, found in a granary, was first sent to the native city of the author. The following are the most esteemed editions of Catullus:—Vossius, Lond. 1684, and Utr. 1691; Vulpius, Patav. 1737; the 'Variorum' of Grævius with Tibullus and Propertius, Utr. 1680. Mattaire's in 1715; in the 'Corpus Poetarum,' Lond. 1713; and Doering, Leipzig, 1788 and 1792.

(Catullus, Suetonius, Vulpius, Bayle, and the different commentators and editors of Catullus.)

CAUBUL, or CABUL. [Afghanistan, p. 169; Beloochistan, p. 198.]

CAU'CASUS (**Καύκασος**) is an extensive mountain system between the Black and Caspian Seas. The general direction of the range is from W.N.W. to E.S.E. It begins on the shores of the Black Sea, or at a short distance from them S. of the small town Anapa, at about 44° 40 N. lat., and 37° 10′ E. long.; and terminates on the shores of the Caspian Sea with the peninsula of Abcheron or Abcheran, at 40° 30′ N. lat., and 50° 20′ E. long.

In length the Caucasus is not inferior to the Alps, the length being hardly less than 700 miles. But the width is considerably less, measuring, where widest, only 120 miles; and where narrowest, hardly more than 60 or 70. If their average width is taken at 80 miles, these mountains cover 56,000 square miles, or nearly the surface of England and Wales taken together.

The Caucasus, in some summits, rises to a greater height than the Alps. The highest ridges are in the two most E. thirds of the whole system. The highest summit, Elbrooz or Elborus, is N. of 43° N. lat., and W. of 43° E. long.; its S.E. side fills the angle formed by this parallel and meridian. This high rocky mass rises to 16,800 feet above the sea, and stands quite isolated, being surrounded by low and marshy ground. The continuous mountain-chain is to the S. of this mass. That portion of the range which extends W. of Mount Elbrooz to the shores of the Black Sea, and afterwards parallel to them, at a distance of about 20 or 30 miles, does not rise to a great elevation; no portion of it is covered with snow all the year round, and Reneggs thinks that it nowhere attains half the elevation of Elbrooz.

That portion of the range which is E. of Elbrooz appears to contain numerous summits and ridges, which rise above the snow line. Kazbeck, between 42° and 43° N. lat., and W. of 45 E. long., attains about 14,400 feet; and further E. occur other high summits, as Tersh and Shah Dagh (King's Mountain), which latter is estimated to rise to between 12,000 and 13,000 feet. There occur other summits nearer the Caspian Sea, which are always covered with snow, but they do not continue far E., and on the peninsula of Abcheron the chain has only the appearance of moderate hills.

The offsets of the Caucasus approach near to the Black Sea, and often advance close to its shores between its commencement at Anapa and the mouth of the Ingour or Engevri, a distance of about 250 miles. Within these limits the shores of the Black Sea are high, bold, and rocky, except at a few points. On the Caspian side the mountains seldom approach the shores. The most N. offset, on this side, occurs on the S. bank of the Koisoo, where it approaches within six miles of the Caspian shore. Farther S. the mountains do not approach the Caspian nearer than about 30 miles, but the rock on which Derbent is built, which forms the extremity of another offset, is less than two miles from the Caspian. Another plain follows, which however only extends from 10 to 15 miles inland, and terminates about 12 miles N. of 41° N. lat. The remainder, including the peninsula of Abcheron, is rather high, and the country is hilly.

The Caucasus is entirely unconnected with any of the great mountain-systems of Europe or Asia. To the S. indeed, a range of hills dividing the sources of the Faz or Rioni (Phasis of the antients), from the basin of the Koor (Cyrus of the antients), and running along the banks of the latter to its source, (near 41° N. lat., and 43° E. long.) unites it to the chains at the sources of the Euphrates and the table-land of Armenia; but these hills are of small elevation. The plain which is traversed by this range of hills, and through which the Koor runs, slopes gradually to the Caspian. The plain, which extends along the N. side of the Caucasus, hardly contains an elevation that deserves the name of a hill; between the innermost corner of the sea of Azof and the Gulf of Kooma, in the Caspian, it sinks so low that it probably nowhere rises 120 feet above the Black Sea. [Caspian Sea.] The offsets towards the N. plain are by far the most numerous, and sometimes extend to 100 miles, but here, as well as to the S., the mountains terminate so abruptly, that even many of the summits, which attain no great elevation, are nearly inaccessible.

The snow line in the latitude of Mount Caucasus varies from 10,000 to 11,000 feet above the sea. One third of Elbrooz is consequently always covered with ice and snow, and a considerable portion of some other summits and ridges. Here, as in the Alps, glaciers are common, and the whole scenery of both mountain-systems has a strong resemblance, except that the Alps have the great advantage of extensive mountain-lakes, in which the Caucasus, so far as is known, is deficient. In the Caucasus the argali (Ovis Ammon) is found, which was long considered peculiar to the table-land of Central Asia and the mountains of Siberia. This mountain-range is also the native country of the common and gold pheasants. In mineral riches Caucasus is probably superior to the Alps. Traces of gold and copper are common, but hitherto these metals have not been worked, except that a small quantity of gold is washed from the sand of some rivers. Iron abounds in many places, and is worked by the natives in a rude way.

There are no active volcanoes in the Caucasus, but traces of volcanic agency occur. Earthquakes also happen sometimes. Naphtha or petroleum occurs in no part of the globe in such abundance as on the peninsula of Abcheron [Baku]; but it is not limited to this part of the Caucasus: it occurs in several places on its southern side, and on the N., on the island of Taman, formed by the two branches of the Kooban. The mud volcanoes of the Caucasus seem to be connected with the naphtha, for they occur only in the neighbourhood of it, especially on the island of Taman, and between Baku and Nawagi, where they are conical hills of earth, without any signs of vegetation on them. From a small crater on their summit issues the thick mud, with which a quantity of naphtha is mixed. Sometimes, as in 1828, these eruptions are attended with flames, and followed by a gushing out of columns of water. On the N. side of the Caucasus there is a great number of hot, warm, and sulphuric waters, especially W. of Elbrooz. Salt lakes abound on the peninsula of Abcheron.

The intercourse between the countries S. & N. of the Caucasus is carried on by two roads. The most E. runs along the shores of the Caspian Sea, sometimes close to it, and sometimes traversing the interior of the plains, which lie between the sea and the E. extremity of the mountains. This road unites Baku with Derbent, and the latter town with Kizlar, on the Terek. Though this road does not pass over high mountain-ridges, it is not much frequented, a circumstance which may be attributed to the difficulty of crossing the numerous rivers, which, in spring and summer, after the melting of the snow, cover a considerable part of the plains with water. These inundations also make the country, for the greatest part of the year, very unhealthy.

The most frequented road is that which traverses the Caucasus nearly in its centre, beginning on the S. at Tiflis, on the banks of the Koor, and terminating on the Terek, at the town of Mozdok. Leaving Tiflis the road runs along the Koor, through a plain: it then ascends the valley of the small river Arakui, or Aragbor, which grows narrower as the road advances N. Near its upper extremity is the small fortress of Passanaur, erected for the protection of travellers against the warlike inhabitants of the mountains. Between this fortress and another, Kasibeg, lies the highest part of the pass, which is more than 8000 feet above the sea; and on each side of it mountains rise several thousand feet higher, the summit of Mount Kazbeck being at a short distance from it, to the W. In other places the road runs on the edge of an abyss, which descends as far under it as the mountains rise above it. This pass preserves the same character as far as the fortress of Dariel (from which it has received the name of the Pass of Dariel), and even to that of Wladikawkas, where the valley of the Terek may be considered to begin. The part farther S. is hardly more than a mere ravine. The difficulties encountered on this road by the traveller are often increased by the fall of avalanches, or the sudden swelling of the torrents, which descend from the high mountains.

Both these roads were known to the antients. That which passes the town of Derbent was called Porta Albanica, from Albania, the name of the country watered by the lower course of the Koor. It was sometimes also called Caspiæ Pylæ, but improperly, that name belonging to another road, by which Alexander the Great descended from the table-land of Persia to the low southern shores of the Caspian Sea. The Pass of Dariel was called by the antients Portæ Caucasiæ.

There is probably no country on the globe, of so small an extent, which contains such a number of different nations, as the valleys of the Caucasus. The natives speak at least seven different languages; but the dialects [illegible] nearly innumerable. Strabo states that, in his time, at least seventy languages were spoken on the Caucasus. Some of these languages are thought somewhat to resemble the Persian, others the language of the Turks, and others that of the Finlanders. That of the Ossetes, or, as they call themselves, of the Iron, contains a great number of German words. The most numerous nations inhabiting the mountains are the Awchases or Abasians, who, with their numerous tribes, are in possession of the S. declivity of the range, between the Black Sea and Mount Elbrooz; the northern side of this range, with its numerous valleys, is occupied by the Circassians. The centre of the range, on both sides of the pass of Dariel, is in possession of the Ossetes or Iron. The Lesghians, or Lesghes, the most numerous and most powerful of the Caucasian mountaineers, occupy the greatest portion of the range E. of the pass of Dariel, and approach the peninsula of Abcheron. They are a warlike people, and the terror of all their neighbours. The extensive mountain tract, bordering on the N. of Mount Tersh, is inhabited by the numerous tribes of the Kisti or Misheghes. In the plains S. of the Caucasus, on the banks of the Koor and Phasis, live the Mingrelians and Georgians. Though all these nations differ in their language, their physical conformation shows that they belong to the same race; and as this race in no other country exhibits such perfection of form, the whole race has obtained the name of the Caucasian race.

Besides these aboriginal tribes, many others, of foreign origin, are met with in the valleys of the range. The most numerous are those of the Turkish race, especially the Tartars. When the different states, which had been founded by the descendants of Djengis-khan, on the countries N. of the Caucasus, were destroyed by the Russians, many of Turkish tribes abandoned the plains and settled in these valleys.

The Greeks became acquainted with the Caucasus at an early period, as the expedition of Jason and the mythology of Prometheus evidently show. But it seems that their knowledge was only derived from information collected by observing the W. portion of the range in navigating the Black Sea. None of their writers seem to have had a just idea of the position and extent of the range before the time of Strabo. Herodotus indeed (i. 203) describes the general position of the Caucasus with sufficient accuracy: it [illegible] says, of all mountain-ranges the most extensive and the highest; and it contains numerous races of men, who live on the fruits of trees. These people ornament their dress with figures of animals, which they have the art of so fixing with certain vegetable colours in their woollen cloths, that they never wear or wash out. The detailed description in the 11th book of Strabo evidently shows that at his time the country to the S. of the Caucasus was well known. This was owing to the expedition of Pompey, who, in his war with Mithridates, advanced to the very foot of the range, and got possession of both banks of the Cyrus and Araxes. (Pallas, Reineggs, Biberstein, Engelhardt.)

CAUCUS, a word used in the United States of N. America to denote a meeting held by a political party for the purpose of securing the election of candidates for any office, or for the purpose of carrying any measure in a general meeting. The name Caucus originated in a dispute which occurred at Boston in New England, a short time previous to the revolution, between a party of English soldiers and some caulkers of the town, and which brought on a scuffle, in the course of which the soldiers fired and killed some of the citizens. The ferment which this occasioned led to meetings on the part of the latter, to determine upon the course most proper to be adopted in order to obtain redress from the government, and these meetings were on the part of the soldiers called Caulkers' meetings. The expression was soon corrupted to 'Caucus' meetings, and has since been used indiscriminately to designate preparatory meetings of any kind; but its more common signification is that above described. (Stuart's *Three Years in North America.*)

CAUDEBEC. [Seine Inférieure, Department of.]

CAUDI'SONA. [Rattlesnake.]

CAULIFLOWER, a kind of esculent vegetable consisting of the fleshy young undeveloped inflorescence of a variety of *Brassica olerucea*, and is hardly different from brocoli, except in being whiter and less hardy. It is said to have been imported from Cyprus about the middle of the sixteenth century. A very rich light warm soil is required for cauliflowers, which must be sown in beds and afterwards transplanted into sheltered situations where they can be protected when young with hand-glasses. They are sown in August for a spring crop, in February for a summer crop, and in May in order to come in at the end of autumn and beginning of winter. Ample directions for their management are given in all books on gardening.

CAUSATION signifies etymologically the *action* of a cause in producing an effect. The theory of causation (*Essai sur la Psychologie*, Paris, [illegible]) necessarily supposes three indispensable conditions: 1st. Two objects (agent and patient); 2ndly. Three changes (that of the agent [illegible] reason of the effect—that of the patient; effect of the action—that which the patient produces on the agent—effect of reaction); 3rdly. Four distinct moments (that which precedes the action—that in which the action begins—that of the reaction—and that after the reaction'). The subject of causation has always been one on which the most subtle thinkers have exerted their powers of analysis; but, as in every similar research after final principles which cannot by any effort of the understanding be clearly discerned and defined, opinions remain still as conflicting as when the inquiry first began. The student, in wandering through the mazes of metaphysical dogmatism, is disposed to turn from a subject on which so much has been said and so little determined: he finds that the statements of writers consist either of that which every one already knows, or of that which no one can at all understand. It appears to be agreed that, though in every instance we actually *perceive* nothing more than that the event, change, or phenomenon B always follows the event, change, or phenomenon A, yet that we naturally *believe* in the existence of some unknown *quality* or *circumstance* belonging to the antecedent A, in virtue of which the consequent B always has been, is, and will be produced. The fact of magnetic attraction is usually adduced in illustration of causative influence: and the inquiry, *why* does the magnet move the iron? suggests the idea of that quality which is denoted by the word *power;* about the nature of which metaphysicians have always disagreed, and their dispute remains still unsettled. It is this attributed *efficiency* in the uniform antecedent of a change which philosophers have considered as forming the *relation of cause and effect;* and their endeavour to express the conception of this hypothetic quality has occasioned the employment of a great variety of terms, as energy, faculty, influence, capacity, ability, virtue, force, possibility, fitness, aptitude, &c. The following citations and references may be serviceable to those who desire to examine the learning of the subject. An account of the antient division of causes into efficient, material, final, and formal, with all the subtleties of the Peripatetic school, is given in Lord Monboddo's *Antient Metaphysics*, 4to. vol. i., p. 33-311; vol. ii., p. 212; and as a choice specimen of the later scholastic doctrine and categorical arrangement of causes, see *Methodus cognoscendi Caussas*, auctore Thom. Isacio, 12mo., 1650. '*Causæ* et effectui respondent *potentia* et actus—illæ eædem sunt res.' (Hobbes, *Opera Philos.*, c. ix., *De Causa et Effectu.*) The following discrimination is important: 'Potentia agentis et causa efficiens (c. x, *De Potentia*), idem sunt re, differunt autem consideratione; *causa* enim dicitur respectu effectûs jam *producti*, *potentia* vero respectu ejusdem effectûs *producendi;* ita ut causa *preteritum*, potentia *futurum* respiciat.'—'All conception of future (ibid., *Hum. Nat.*) is conception of *power* able to produce something—we so far conceive that anything will be hereafter as we know that there is something at present that hath power to produce it; and that anything hath power to produce another thing hereafter, we cannot conceive but by remembrance that it hath produced the like heretofore—power simply is the *excess* of the power of one (the agent) above that of another (the patient).' 'The idea of *power* (Locke, b. ii., c. 21, *Of Power*) is that of *possibility*, faculty, ability to make any change—all power relates to *action*—power is not the agent, but the *relation* (of an object to its future action)—how mind excites motion by the *power* of thought, and how body communicates motion by the *power* of impulse, we are equally in the dark, (c. xxiii.)—to have the idea of cause and effect it suffices to consider any thing as beginning to exist by the operation of some other, without knowing the *manner* of that operation (c. xxvi. *Of Cause and Effect*, and see c. xxv. *Of Relation*). The far-famed and much-disputed, though not original, opinions of Hume, which, with some slight modification have been adopted by Dugald Stewart, Dr. Brown, and others, are contained in sec. 4, 5, 6, 7, 8, 11, of his *Philos. Essays*, from which the following passages are taken. Consistency is not to be looked for in Essays professedly *paradoxical* and designed less for the development of truth than as ingenious specimens of the dialectic art. 'We *suppose*,' says Hume, 'there is a connection between cause and effect; a *power* in the one by which it infallibly *produces* the other—power is that circumstance in the cause by which it is enabled to *produce* the effect—when we consider the *unknown* circumstance of an object by which the degree or quantity of its effect is fixed and determined, we call that its *power*—the effect is the measure of the power—the utmost scrutiny can never discover but one event following another, without being able to comprehend any *power* by which the cause operates—no rational philosopher has ever pretended to assign the *ultimate cause* of any natural operation, or to show the action of that *power* which *produces* any effect; these ultimate principles are totally shut up from human inquiry—the *power* of the will in effecting animal motion is unknown and inconceivable; we are ignorant how bodies act on bodies, and how mind acts on itself and on body: it is a thing entirely incomprehensible—we have no idea of power at all: it is a word absolutely without any meaning either in philosophy or common life—were our *ignorance* therefore a good reason for rejecting any thing, we should deny all energy in the Supreme Being as much as in matter; experience only teaches us how one event consequently *follows* another, without instructing us in the secret connection which binds them together; we know nothing more of causation of any kind than merely the constant conjunction of objects: all events seem entirely loose and separate; one follows another, but we never can observe any tie between them: all we know of the matter is, that a cause is that *after* not *by* which anything constantly exists—it is an object *followed* by another, and where all the objects similar to the first are followed by objects similar to the second, or where *if the first had not been the second never had existed*—it is absolutely impracticable to *define* a cause without comprehending as a part of the definition a *necessary connection* with its effect—belief of similar effects from similar causes is a natural instinct which reasoning can neither produce nor prevent.' From observations so full of at least apparent contradiction, it is not surprising that both the denial and admission of the principle of causative power are imputed to their author by different writers. Many of the works written in refutation of Hume contain ingenious remarks, though little of discovery. (Beattie *On Truth*, c. v.; Oswald; Priestley.) By Dr. Reid, Hume's opinion of *power* as having no objective reality beyond the imagination, is strongly opposed. (*Intellectual Powers*, 1827, p. 440-459). 'The notion of power, it is said, is one of our earliest abstractions, a notion the most explicit and universal, for the expression of which all languages have distinct and appropriate words.' The remarks of Dr. Price (*Moral Questions*, p. 29) deserve attention: 'What can *do* nothing—what is *fitted* to answer no purpose, has no *dependence, aptitude* or *power*—can be nothing real—the whole meaning of *accounting for* a fact implies something in the nature of objects or events that connects them, a *fitness to influence* one another.' Price, Reid, Newton, and most writers on the subject, agree that 'where there is no substance there is no power, that is, that all power is the power of something; but by Sir Wm. Drummond (*Academ. Questions*, 4to., p. 10) and some others, it is contended that 'power is not an *attribute*, but an independent primary indemonstrable *principle*, the cause of all things: and that we can possess a notion of the *existence* of it, as of the *vis movendi*, without any notion of its *nature*.' The opinions of Dr. Stewart on the subject are not remarkable either for novelty or consistency. (*Elements of Philos*, vol. i. and ii.) 'In every change we have an *irresistible* conviction of the operation of some *cause*—it is a law of our nature; the mental association of cause and effect is of a most indissoluble nature—the idea of *cause* or *power* necessarily accompanies the perception of change—the human mind surely has a natural bias to conceive things as somehow linked together; possessed of *powers* and *virtues* which *fit* them to produce particular effects: but that we have no reason to believe this, is evident on a moment's reflection—it is a prejudice.' Along with this declaration is enforced the propriety of distinguishing physical from *final* or *efficient* causes, that is, from those 'powers and virtues' which are declared to have no existence. 'There may be,' says Dr. Stewart, 'no *necessary* connection among any phenomena we observe;' the doctrine of necessity depends upon the truth of the proposition that every change has a cause with which it is *necessarily* connected.' But what is meant by necessary unless that which cannot be varied or avoided? And surely this may be predicated of human actions, if the laws of matter and mind are immutable, that is, if the course of nature does not change but continues to proceed in its established order, for then, as the universe exhibits an uniformity of sequence in successive phenomena; or, in other words, consists of a series of uniform causes and effects, or *antecedents* and *consequents*, for the difference of name is quite unimportant, man *must*, in the nature of things, assuredly be the creature of circumstances, and *must* act as he is acted on.

The work of Dr. Thos. Brown, entitled 'An Enquiry into the Relation of Cause and Effect,' is well known as a specimen of superior metaphysical analysis. The main points of the theory it contains are given more concisely in one of Dr. B.'s Lectures, vol. i., p. 135, and a particular account of the work, with a notice of some objections to its doctrine, is given by the Rev. David Welsh in his 'Life of Dr. Brown' (p. 98 et seq., and notes I and N in [illegible]dix.)

As this 'Enquiry' was originally designed expressly to vindicate and explain the theory of Mr. Hume, it cannot be expected to contain anything essentially or importantly different; and that it does not is evident on a comparison of the leading propositions. Dr. B. perfectly coincides with Hume in maintaining that the relation of cause and effect is not known *à priori*, but from experience: and that after experience it is not discoverable by *reason*, but is merely an object of *belief*—a notion arising from 'an instinctive principle of faith.' Hume's assertion that, the *sentiment* of this relation is derived from experience only of the *customary* conjunction of objects, and arises merely from the mental act of *transition* from one object to the other, is contradicted by Dr. Brown; but Hume in his parodoxical humour has often incidentally done this for himself. The proposition of Hume that, *as to our knowledge*, there is 'nothing but one event or object *following* another,' is that which Dr. B. reiterates throughout the 600 pages of his treatise, in showing that, 'in a sequence of causes and effects, whether as to the phenomena of mind or of matter, there is absolutely nothing more than the antecedents and consequents themselves;' that the idea of power, when acutely analyzed, is simply the idea of A itself, as that which invariably, and without the intervention of anything whatever, is followed by B: the relation of things as to *power* being, in fact, their relation as to *time*: and the question about cause and effect, a question solely about the uniform priority and posteriority of events in time. The idea of action, force, and energy is also resolved into that of simple antecedent and consequent: so that all is reduced, as Hume has it, to one thing, not *by* but *after* another. This identification of the idea of power with that of an antecedent having an invariable relation to a consequent, only as to *time*, has been regarded by many as virtually a denial of the reality of what is named causal power; but Dr. B., no less than other philosophers, appears to have the same vague conception of an indefinable something which, known only by its operations, constitutes at once a latent portion of the whole qualities of an object, and forms its efficiency to create a certain uniform change in another. He says that power is the relation of a particular antecedent to the uniform change that follows, and that he feels this relation to be a fitness or aptitude in the former to produce the latter. He says that 'God formed objects with powers to be antecedents of changes;' that matter, like mind, is capable of beginning changes; and that we believe in the relation of cause and effect, 'not because we can demonstrate it to ourselves or to others, but because it is impossible for us to disbelieve it; the belief being in every instance intuitive.' But if proof be wanted that Dr. B. entertained an orthodox notion of power as a productive principle, it is given in the positive assertion of his personal friend and biographer, the Rev. Mr. Welsh (p. 131), who says, that were his theory of causation *really* deficient in this particular, instead of commending he should reject it as 'a monstrous heresy.' If this be so, it is amusing to see Dr. Brown reprimanding Dr. Reid for dealing in 'a tissue of distinctions merely verbal,' about 'a mysterious unintelligible *something*.' The truth is, that *power* is merely a name for human ignorance: the mind feels uneasy and dissatisfied in contemplating the unaccountable gap between an antecedent and consequent, and readily adopts any hypothesis that will put a bridge over it; hence the *power* of gravitation, the *power* of volition, &c. Dr. Brown's definition of cause as that which *immediately* as well as invariably precedes a change involves an obvious *petitio principii*: for the question is whether B really is immediate to A, as known to us? whether there exists a third co-efficient to causation? but this question can never be answered.

Of the numerous strictures which have appeared on the theory of Dr. Brown, we may notice the two following:—'An Essay upon the Rel[illegible] of Cause and Effect, controverting the doctrine of Hume, [illegible]n, and Lawrence,' 8vo. 1824. The author contends that [illegible]ency and subsequency are not essential to the proper [illegible]tion of cause and effect; because, although an object, in order to act as a cause, must exist antecedently to such action, yet that when it does act as a cause, its effects are synchronous with that action, and are included in it; that it is not mere sentiment, but reason (the faculty of perceiving the *ratios* of things), which produces the conviction that everything which begins to exist must have a cause; and which forces the mind to perceive that similar causes must necessarily have similar effects; that nature cannot, without a contradiction of terms, be conceived to alter her course, and therefore that no other change could ensue than that which, in any given instance, does ensue; and that we derive, from the observation of changes, and from the operation of reason, the notion of that producing principle which we denominate *power*. In the translation, by Mr. Henry, of the 'Elements of Psychology,' by Victor Cousin, 1834, the theory of Hume and Brown is considered as asserting an unconnected succession of phenomena, without the admission of any idea of causative efficiency: some elaborate remarks of the translator, in accordance with the doctrine of the author, are therefore given to exhibit its 'falsehood and fallacy.' It is said that Dr. Brown confuses and mistakes the two distinctly different conceptions of *uniform antecedence* and *causation*; that he takes the former, which is only a *condition* of the idea of causation, for the idea of causation itself, which includes something *more* and *different*, as proved by the consciousness of the relation of muscular motion to the act of volition, and by the usages of all languages, &c., that the idea of cause is that of a doer, actor, producer, changer, mover; and that the degree of motion produced is correspondent to the degree of causative power exerted. An exposition of the doctrine of causation adopted in the transcendental theory of Kant may be found in the article on philosophy by Thomas Wirgman, vol. xx. 'Encyclop. Londinensis' (see 'Causation' in Index, p. 252). By the Kantians the conception of the relation of cause and effect is considered as a synthetical judgment *à priori*—a postulate of pure reason. It is a remarkable fact in the history of metaphysical science, that the speculations of Hume on the idea of causation suggested to Kant the first notion of his system of transcendental ideas, that is, ideas which possess the character of universality and necessity. By Dr. Abercrombie, in his work on the intellectual powers, 1832, the subject of causation is considered as belonging to those 'first truths,' any demonstration of which it is absurdity to attempt (pp. 187-208-214). The following citation is from a learned metaphysical work (Harpur *on Philosophical Criticism*, 4to. 1810):—'All relation of necessity exists in some quality, property, or attribute which is common to the things related; if things be related as cause and effect, such relation must belong to the predicaments of action and passion: all action implies motion either of body or mind; it is *motion* therefore which, being communicated, is common to the two objects, and is that which constitutes the relation of cause and effect.' It would be endless to enumerate works in which the subject of causation is discussed. The treatise of M. Maine de Biran on the relation of cause and effect is highly commended by Cousin. Many works on natural theology and free-will contain more or less on the subject—Hobbes, Clarke, Leibnitz, Collins, Hume, Butler, Cudworth, Edwards, Coplestone, &c.

CAUSE (in Natural Philosophy). We have here only to explain the manner in which this word is used, and not to enter into any speculation upon the connexion of cause and effect. In common language we say that *A* is the cause of *B*, when we have observed that *B* never appears without *A* having preceded, and also that *A* is always followed by *B*. And, generally speaking, we are in the habit of assuming the phenomenon which comes first to be the cause, and that which comes afterwards, the effect. In natural philosophy the word cause is used in two senses, which may be distinguished into true and hypothetical; and it is found convenient for distinction to latinize the former term into *vera causa*. By a *vera causa*, or true cause, is meant the word cause used in the ordinary sense, namely, that which is actually concerned in producing the effect. Thus the rotation of the earth is a *vera causa* in the production of day and night; and in the article ATTRACTION the notion defined under the words *physical attraction* is the supposition that attraction is a *vera causa* in the production of the celestial motions.

There are two different ways in which the word cause is used in the sense which we distinguish by the word *hypothetical*. The first is when we are able to prove that phenomena take place exactly in the manner and to the extent which would necessarily be if a certain supposition were true; so that we cannot be led into error *as to results*, if we assume that supposition to be true. Thus the supposition of the stars being all fixed in an immense crystal sphere, which sphere is turned round from east to west, is one from which the apparent motions of the stars, such as they are, would necessarily follow, and, being frequently applied to the explanation of the details of the heavenly motions, is then assumed as an hypothetical cause. And when it is found that the motions of all the planets are precisely such as would take place if the sun attracted them all, and they each other, as implied in the word gravitation, then the attraction which is sufficient to produce the effects in question is assumed as an hypothetical cause. Thus in the old disputes about the motion of the earth, each side admitted that the other produced an unobjectionable hypothetical cause, and the point in question was, which had the *vera causa*. And formerly it was discussed whether gravitation was a primary quality of matter, or whether the intermediation of other matter was employed. The second supposition involved the attempt to explain gravitation, by introducing some other quality of matter as the *vera causa*, in place of the hypothetical attraction. And the doctrine of immaterialism [BERKELEY] is an attack upon the notion of *matter* as a *vera causa* for the phenomena of the external world, though as an hypothetical cause it is admitted as an unobjectionable mode of speaking.

Secondly, a phenomenon is cited as the hypothetical cause of another, when the two are always found together, and the nature and quantity of the second are connected by an invariable law with the nature and quantity of the first. In this sense we have seen, in the article CAPILLARY ATTRACTION, that because convexity and depression always go together, and also concavity and elevation, the depression is referred to convexity, and the elevation to concavity, by the same sort of language as would be used if the first of each couple were the *vera causa* of the second. This is a language of convenience, but is apt to be misinterpreted.

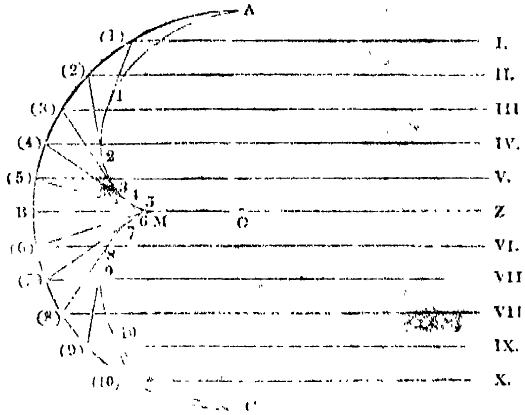
Questions as to whether hypothetical causes are true or not, do not now occupy the attention of philosophers to the extent which was formerly the case. When the motions observed to exist in any system are sufficiently known, the pressures or other admissible species of action which would be sufficient to produce these motions are at once substituted as hypothetical causes. Thus, though the connexion between magnetism and electricity renders it an object of curiosity to trace them to some common hypothesis, few, we imagine, would attempt to find the *cause* of magnetism in the sense of the *vera causa*. It is otherwise when an hypothetical cause is found not to be sufficient to produce all observed effects. For example, the *undulatory* theory of light has prevailed over the *emanatory*, not because we have less reason to suppose that light is an emanation of particles from the sun and stars than existed a hundred years ago; but because it is found that many lately discovered facts are *not* such as would be true if light were an emanation, but *are* such as would be true if it consisted in undulations excited in an elastic medium. And though this cannot but favour the supposition that the undulations are the *vera causa*, yet that remains only a probability; the certainty is that the phenomena of the reflexion, polarization, &c., as hitherto observed, are all such as would necessarily follow, if the theory of undulations were true.

It must appear at first that this application of the word cause makes the ultimate end of natural philosophy much less imposing, if not less important, than the more common idea; which consists in supposing that the reasons (*veræ causæ*) of phenomena are discovered. But whether this be so or not, it is the only rational and demonstrable method of using the word. And it must be observed that all similar phenomena are thus, as it were, bound up together, and made to belong to one system. If then we refuse to say, with many popular works on physics, that 'Newton was the first who found out *why* water runs down hill,' we conceive that we are not altogether without a substitute when we say, that Newton was the first who connected the motion of water down hill with all the motions in the solar system in such a manner that any new information as to any one of them can be extended to all.

But the great use of hypothetical causes lies in this, that they tell us, as long as they last, what to look for. The cause being assumed, the application of mathematics points out the time or circumstances under which to look for new phenomena, or at old ones in a new method. Thus several phenomena with regard to light, which might have remained long unobserved, have been predicted by computation from the undulatory theory, and subsequently verified. And in the planetary system, several motions too small to be easily detected, except by a person who previously knows in what manner and at what time to watch for them, have been added by theory alone to the list, and verified by observation.

The language of causation is sometimes misapplied in this way: the proof that a thing is, is called the reason why it is. Thus we remember seeing in the notes to Simson's edition of Euclid an assertion that geometry gives the reason *why* two sides of a triangle are greater than the third, whereas we never could detect any thing more than the proof that they *are* so.

CAUSTIC (in Optics). When a number of rays proceeding from a point are reflected or refracted at or through any number of media, they will not, in most cases, be all thrown to the same point again, but will be dispersed in such a manner as all to touch some curve or surface depending for its form and position upon the position of the luminous point, and the form and position of the reflecting or refracting curve or surface. This curve is called the *caustic* of the surface. We shall now give a case of the most simple kind. A reflecting curve A B C of a semicircular form receives rays coming from a point on B O produced, but at so great a distance, that they may be considered as parallels. The rays I, II, III, &c., strike the semicircle at (1), (2), (3), &c., and are then reflected in the directions (1)1, (2)2, (3)3, &c. The curve A M C, having a cusp at M, is constructed in such a manner that any ray whatsoever moving parallel to Z B, shall, after reflection at the circle, touch or graze this curve, which is therefore called the *caustic by reflection for parallel rays* of the semicircle A M C. And the space A M Z will not be illuminated by any of the *reflected* rays coming from any point in A B, but only by those which come from a part of B C, which, after touching C M, their branch of the caustic, proceed and cut through A M. The consequence is, that the space A M C B will be much more highly illuminated than the exterior space; an effect which may be rendered visible by placing a ring, with a bright interior surface, upon a table, in the sun-light. It will then become evident, by a



part of the table within the fig., of the form A M C B, becoming brighter than the rest, that the greater portion of the reflected light strikes the table within such a curve.

The point which it is of most importance to notice in relation to caustics is the following: it is usual to suppose, for the sake of convenience, that all reflected or refracted rays converge to a point. This is practically true; or rather we may say that such a number of rays are collected by mirrors and lenses so near to a point, that the effect of a complete convergence is produced. If we look at the diagram, we see that all the rays which enter between I and III are far from being nearly reflected to a point, but are scattered along the caustic from 1 to 3. But an equal number of rays entering between V and VI is collected between 5 and 6 on the caustic, very near to M. The consequence is, a sufficient convergence of rays near M to give a bright image of the luminous point whence the rays came, to the formation of which it is evident that only the parts of the mirror near B will be efficient. No curve except a parabola would, in the circumstances of the diagram, make every ray converge accurately to one point.

A complete theory of caustics would include that of telescopes and microscopes of every kind; but would be of no practical use, except so far as relates to the cusps and the parts of the curve near them. These curves were first considered by Tchirnhausen, who gave them their name, and afterwards by John Bernoulli. They are much treated of in the older English works on optics, in a geometrical manner. The algebraical question, in its most general form, has been investigated by Malus in his 'Théorie de la Double Réfraction,' Paris, 1810; and lately by Professor Hamilton in two papers on 'Systems of Rays,' published in the Transactions of the Royal Irish Academy. The question of EVOLUTES is nearly akin to that of Caustics.

CAUSTICS. [ESCHAROTICS.]

CAUX, a district under the old régime of Upper Normandy: according to some authorities, as the *Encyclopédie Méthodique*, it was bounded on the N. and W. by the sea and the Seine, on the S. by Le Vexin Normand, and the country of Bray, and on the E. by the river Bresle, which separates it from Picardie; but other authorities restrict it within narrower limits. It is a flat but rather elevated district, producing plenteous grain harvests, and having much pasture land. It is especially abundant in fruit; the villages and even the farm-houses are surrounded with orchards, and cider and perry are the common drink of the country. Besides the above-mentioned productions, flax and hemp are grown, and there is a good supply of vegetables, game, and fish. The poultry is in high repute.

The principal manufactures of the district are coarse brown linens for sail-cloth or packing, leather, paper, glass, &c. The atmosphere of the coast is foggy.

The women of this part of France are celebrated for their fine complexion and the peculiarity of their apparel. The capital of the district was Dieppe (population, in 1832, 16,016) according to some; but those who give to Caux a smaller extent make either Caudebec (population, in 1832, 2782 for the town, or 2832 for the whole commune) or Montivilliers (population, in 1832, 1988 for the town, or 3828 for the whole commune) the chief place.

Caux takes its name from the Caleti, who inhabited this district in the time of Julius Cæsar; they were a branch of the great Belgian race, but their power, as may be judged from their contingent of the forces confederated against Cæsar, was far inferior to that of many other tribes.

CAVAILLON, a town in the South of France, in the department of Vaucluse. It is on the right or N.E. bank of the Durance, about 18 or 20 miles above the outfall of that river; in 43° 50′ N. lat., 5° 3′ E. long. This town was known during the Roman dominion in Gaul by the name Cabellio; and antient writers are not agreed whether it was a town enjoying the *jus Latii*, or whether it was a Roman colony. It was in the country of the Cavares. There have been some remains of Roman antiquity discovered here; and there are probably even yet some remains of a triumphal arch at the entrance of the cellar of the former episcopal palace. Upon the downfal of the Roman empire, the town came into the hands of the Burgundians, afterwards of the Franks. In the middle ages, it was subject successively to counts of Arles and Provence, and the counts of Toulouse, until, with the rest of the county Venaissin, in which is situated, it came into the hands of the pope. The had formerly a port on the Durance; but the inundations of that river having changed its bed, the port has been destroyed.

The town of Cavaillon, according to Expilly (A.D. 1762), has four gates, one of which was damaged by an earthquake in 1731; the streets are narrow and inconvenient. There were a cathedral and several religious houses; but the diocese was abolished at the Revolution, and the town is now included in the archiepiscopal diocese of Avignon; the religious houses have also been for the most part suppressed.

The population of the town, in 1832, was 3845; that of the whole commune, 6911. Among the inhabitants are many Jews. The chief trade is in the agricultural productions of the neighbouring district, which is remarkably fertile, owing to the rich mud deposited by the inundations of the Durance, and the care of the inhabitants in providing manure. The produce consists of green peas, artichokes, garlic, peaches, and mulberries.

CAVALIER was formerly an ordinary English term for a horse-soldier; but it has an additional and historical meaning by having been assumed by, or given to, the adherents of Charles I. in the civil war, to distinguish them from the *Roundheads*, the name given to the adherents of the Parliament.

CAVALIER, a work whose rampart is raised several feet above those of the fortress in which it is formed. It serves either to defilade those ramparts from the fire of an enemy on a neighbouring height, or to afford a plunging fire into the trenches of the besiegers. It is generally constructed on the terreplein of what is called a full bastion, and sometimes upon the rampart of a curtain: its form, on the plan, was originally semicircular; but the cavaliers in bastions are now built with straight faces and flanks parallel to those of the work in which they are placed.

A cavalier thus formed and situated is proposed by Cormontaingne as a retrenchment in a bastion. He recommends that on its exterior, along the two faces, there should be a ditch whose sides have revetments of masonry; and that the ditch should be defended by traverses connecting the faces of the cavalier with those of the bastion, near the shoulders of both.

Trench cavaliers are works raised by the besiegers on the glacis of a fortress, in order to enable them to direct a plunging fire of musketry into the covered-way. They are formed of gabions placed in tiers above each other and filled with earth.

CAVALIERI, BUONAVENTURA, was born at Milan in 1598, and entered into the order of Jesuits at an early age. He was afterwards professor at Bologna, and died there December 3, 1617. He was a pupil of Galileo, according to the testimony of his friend Riccioli, who professes himself much indebted to his assistance in his studies. But it is said that he did not obtain the professorship at Bologna, in spite of the strong recommendation of Galileo, until his skill in astrology had been duly certified. He was a victim to the gout both in hand and foot, and was confined almost entirely to his bed for twelve years before his death. There is an *éloge* of him by Frisi (quoted by Lacroix, *Biog. Univ.*). All his works were published at Bologna, being 'Specchio Ustorio,' &c. 1632; 'Directorium Generale Uranometricum,' 1632; 'Geometria Indivisibilibus Continuorum,' &c. 1635; 'Trigonometria Plana et Sphærica,' 1635; 'Rota Planetaria,' 1640; 'Exercitationes Geometricæ Sex,' 1647.

If we may judge from a contemporary biographer, Ghilini, 'Teatro d' Uomini Letterati,' Cavalieri (or Cavalerius, as his name is usually latinized) must have enjoyed a remarkable reputation in his day. But he has descended to posterity solely through his method of *indivisibles*, one of the predecessors of the doctrine of fluxions, and which [BARROW, LEIBNITZ, DIFFERENTIAL CALCULUS] must be considered as one of the first attempts at an organized method of dealing with the difficulties of the solution of which Archimedes had given the first example. Cavalieri considers a line as composed of an infinite number of points, a surface of an infinite number of lines, and so on, as in the following sentence: 'Hinc manifestum est figuras planas nobis ad instar telæ parallelis filis contextas concipiendas esse; solida vero ad instar librorum, qui parallelis foliis coacervantur. Cum vero in telâ sunt semper fila, et in libris semper folia numero finita, habet [habent] enim aliquam crassitiem, nobis in figuris planis lineæ, in solidis vero plana numero indefinita.... supponenda sunt.' This method, ab-

solutely considered, is defective and even erroneous but the error is of the same kind as that of Leibnitz, who considered a curve as composed of an infinite number of infinitely small chords, and a surface of infinitely small rectangles. The error in both is one which does not affect the result, for this reason, that it consists in using the simplifying effect of a certain supposition too early in the process, by which the logic of the investigation may be injured, but the result is not affected. For instance, Cavalerius would consider a right-angled triangle as follows. Let n be the number of points in the base, then the perpendiculars at these points are in arithmetical progression, $0, a, 2a$, &c.... na: the sum of all of which is $\frac{1}{2}n(n+1)a$, or $\frac{1}{2}n.na$, throwing away $\frac{1}{2}na$ as inconsiderable compared with $\frac{1}{2}n.na$, when n is infinite. But $\frac{1}{2}n.na$ is simply $\frac{1}{2}$ base × perpendicular. Compare this method (absurd and almost unintelligible as it is, in the literal sense of the terms) with the following. Divide the base (b) into n equal parts, each of which is therefore $\frac{b}{n}$. Let the perpendicular be p, consequently the perpendiculars at the extremities of the parts are $\frac{p}{n}, \frac{2p}{n} \ldots$ up to $\frac{np}{n}$, and each multiplied by $\frac{b}{n}$, and the sum of the whole being taken, we have

$$\frac{b}{n}\left(\frac{p}{n}+\ldots+\frac{np}{n}\right)=\frac{bp}{2}\,\frac{n^2+n}{n^2}=\frac{bp}{2}\left(1+\frac{1}{n}\right).$$

This is the sum of the inscribed rectangles, which (see the process in ACCELERATING FORCE) approaches without limit to the area of the triangle as n is increased without limit. But it approaches to $\frac{1}{2}bp$ on the same supposition; whence $\frac{1}{2}bp$ is the area of the triangle. Either method, with caution, might be made to give true results, and in an intelligible manner; but that of Cavalerius is very subject to error, and, we may say, requires a knowledge of better methods to understand it. But it is nevertheless the first attempt at generalization, and serves to illustrate the position maintained by us [BARROW], that neither the fluxions of Newton nor the infinitesimals of Leibnitz were the actual methods by means of which the Differential Calculus (as now known) was made powerful. Cavalerius, with *the methods of development* of Newton, might have establishsd his title to the invention. But his algebra was very imperfect, even for his day: we cannot see proof, in 1647, that he had ever seen the writings of Vieta, who died in 1603. The celebrated Guldinus wrote against the method of indivisible, and was answered by Cavalerius in the third of the Exercitationes Geometricæ.' Roberval claimed the method as his own, but his first publications on the subject followed those of Cavalerius.

CAVALRY (remotely from the Latin *caballus*, 'a horse') is that class of troops which serve on horseback; and, in the British army, it consists of the two regiments of Life Guards, the royal regiment of Horse Guards, seven regiments of Dragoon Guards, and seventeen regiments of Light Dragoons, of which the 7th, 8th, 10th, and 15th are Hussars, and the 9th, 12th, 16th, and 17th are called Lancers.

Among the antients, while warfare consisted in expeditions to remote places rather for plunder than conquest, a numerous cavalry was indispensable. In proportion however as the art of war improved, this class diminished in value: the strength of the Greek and Roman armies lay chiefly in the firm array of their foot-soldiers, and Folard observes that the most certain evidence of decline in the military character of a state is the existence of a numerous cavalry. A well-disciplined cavalry has however often turned the scale of fortune in war: cavalry contributed greatly to the conquests of Philip and Alexander, and the superiority of Scipio over Hannibal in cavalry was the cause of the victory at Zama. In modern times, Seidlitz gained by his cavalry the battle of Rosbach in 1757; and the victory at Wurzburg in 1796 was decided by the same arm.

In the early French monarchy, and in the Anglo-Saxon kingdoms of Britain, the men of wealth and noble birth distinguished themselves in the field from those of inferior rank by being well armed and mounted on horses. And during several centuries in which the poverty of the nations prevented princes from maintaining standing armies, and when the foot-soldiers were men undisciplined and ill-provided, and summoned from the plough to attend the sovereign for a short time only, it is evident that a class of comprehending those men who, by the tenure of were required to serve in the wars at their own charges, and to bring into the field a number of dependents mounted like themselves, and trained in the daily practice of martial exercises, must have constituted almost the only efficient arm of battle.

In France the superior classes of these warriors bore the title of knights bannerets, and the others were designated knights of the second order, or bas-chevaliers. In those days the infantry, for the reason before mentioned, being held in little estimation, the strength of armies was denoted by the number of banners and pennons under which the knights and their attendants fought; victories also were distinguished only by the number of men of rank who had been slain or made prisoners.

But the power of the nobles becoming too great for the monarch, and their mutual jealousies constantly involving the nation in the miseries of civil war, Charles VII., in 1445, took advantage of the temporary tranquillity which reigned in France after the English had been compelled to abandon nearly the whole of that country, to reduce his military force. From that time the kings retained in constant pay fifteen companies, as they were called, each consisting of 600 horsemen, besides the young men bearing the title of archers and pages, who also in general fought on horseback, but were clothed in a lighter armour. The troops composing the companies appear to have been what would now be called gentlemen; and the esteem in which they held themselves is evident from the refusal of the Chevalier Bayard, on the ground of their quality, to unite them with the Lansquenets (German infantry) at the siege of Padua, in an assault proposed by the Emperor Maximilian to be made on the place.

More than a century before the time of Charles VII., the English cavalry in the pay of the state was divided by Edward III. (1324) into small bodies, commanded by officers called constables: and Grose observes, that the list of the army at St. Quintin (1557) is the first in which a body of cavalry is distinguished by the appellation of a troop: a name which is still given to the half of a squadron, or the eighth part of a full regiment.

The respectability of the French companies above mentioned seems to have declined from about the time of Francis II., men of a lower grade being then occasionally introduced, from the difficulty, it is said, of filling with men of high birth the ranks, which were become very numerous.

But the employment of artillery in the field deprived this heavy armed cavalry of all the advantages it possessed over the soldiers who fought on foot, and the latter were often enabled to maintain the combat after the horsemen were dismounted or forced to retire; hence they gradually rose in reputation, and the good discipline and conduct of the Swiss infantry in the Italian wars induced the French and Germans to augment the number of the troops of this class in their armies. From that time the cavalry, though always an essential arm in war, may be said to have been inferior in importance to the infantry.

It appears that light cavalry did not, before the age of Louis XII., exist as a distinct body having general officers and a staff; but Montluc, in the reign of that monarch, mentions a general of 1200 light horse; and the corps must have subsequently become numerous, for it is said that Henry II., in 1552, had 3000 such troops under his command in his expedition to Germany.

The dragoons are a species of light cavalry, trained to act either on horseback or on foot as may be required. Père Daniel ascribes their formation to the Maréchal de Brissac, when he commanded the French armies in Piedmont at the end of the sixteenth century. The practice of horsemen fighting on foot is however very antient: the Roman cavalry are said to have done so at the battle of Cannæ, and Procopius relates that one of the generals of Justinian, in an engagement with the Persians, caused his horsemen to dismount, and oppose their lances to the enemy's cavalry. Dragoons appear to have been introduced into the English service before the middle of the seventeenth century; but the oldest regiment of dragoons in the army is that of the Scotch Greys, which was raised in 1681. Dragoons perform the duty of advanced guards and patroles; they escort convoys, and harass the enemy in his retreat; or, in reverses of fortune, they protect the dispersed and defeated infantry. The *name* Dragoon appears to come from the Latin Draconarius, the appellation given to a standard-bearer, who carried a standard or colour with the figure of a dragon on it. (Ammianus Marcell. xx. 4; Vegetius, ii. 7.)

Hussars are also a species of light cavalry, which originally constituted the national militia of Poland and Hungary. In France they were formed into a corps in the time of Louis XIII., under the name of Hungarian cavalry; and the class of troops was subsequently adopted in this country. It is uncertain from whence they obtained their present denomination, but probably from the shout they formerly gave before beginning action. They are now employed to protect reconnoitring and foraging parties, and to serve as patroles.

The Lancers were introduced into the British service in order to correspond to the corps of what were called Polish Lancers in the French army. The long weapons carried by this class of troops were supposed to be of use in a charge against infantry; and the fluttering of the flag at its extremity, by alarming the horse, to give an advantage over a dragoon otherwise armed.

In the late war a portion of the French cavalry was furnished with cuirasses, and, in imitation of them, the English Life Guards have since borne the same heavy armour. These troops carry only a sword and two pistols; the heavy cavalry in general carry carabines, pistols, and swords; and the light cavalry very small carabines, pistols, and sabres. A complete regiment of cavalry is divided into four squadrons, and each of these into two troops. The full strength of a troop is 80 men; and to each troop there is appointed a captain, a lieutenant, and a cornet.

CAVAN, an inland county of the province of Ulster in Ireland; bounded on the N. and N.E. by Fermanagh and Monaghan; on the S.E. and S. by Meath, an angle of Westmeath, and Longford; and on the W. by Leitrim. Length, N. to S., 22 Irish or 28 English miles; breadth, from S.E. to N.W., 40 Irish or 51 English miles; area 600 square English miles, or 384,181 statute acres. Gross population in 1821, 195,076; in 1832, 228,040.

Cavan is the southernmost county of Ulster. Stretching across the narrowest portion of Ireland, it extends on the E. to within 18 English miles of the Irish Sea at Dundalk; and on the W. to within 20 miles of the Atlantic at Sligo Bay. The county is in form an irregular oval. It rises into mountains of considerable height at its N.W. extremity, but more than two-thirds of its surface, although high and very irregular, present no elevations of any consequence. Slieve Russell, the highest point of the N.W. chain, forms, with the remainder of the Ballynageeragh Mountains, the southern boundary of the basin of Loch Erne, the chief feeders of which lake flow from this county. From Loch Gawnagh on the S., where Cavan joins the county of Longford, the river Erne flows northward, through Lough Oughter and Belturbet to the borders of Fermanagh, where, after nearly bisecting the county of Cavan, it enters Upper Loch Erne at the same point with the Woodford, a considerable stream which also crosses the county a little farther N. from a small lake on the borders of Leitrim. The Erne between Loch Oughter and Upper Loch Erne receives the waters of the Annalee, which, rising from two lakes on the borders of Monaghan, runs nearly W. through the flat country between Cootehill at its source and Butler's Bridge near its confluence. Lough Sheelin and Loch Ramor, or Virginia Water, are also two considerable lakes in this county; the first discharges its waters through Westmeath by the Inny, a feeder of the Shannon, the second through Meath by the Blackwater, a tributary of the Boyne. The chief lines of road are in the direction of the greatest length and breadth of the county, from Navan in Meath on the S.E., to Belturbet and Florence Court on the borders of Fermanagh on the N.W., and from Killeshandra on the S.W. to Cootehill on the N.E.; the point of intersection is at Cavan, the assize town, situated very nearly in the centre of the county. The cross-roads are generally ill-planned and in bad repair. There is no navigation in this county except between Belturbet and Loch Erne; but the Ulster Canal now in progress will open a communication between Belturbet and Loch Neagh.

The climate of Cavan is rather rainy and boisterous; in the mountainous district it is particularly severe; yet it is far from unwholesome in any part, the people being rather remarkable for health and longevity. The general formation of the district is schistose. A patch of granite about seven miles square occurs in the eastern part of the county, and assists in explaining the broken character of the hills in that district, the presumption being that the granite extends, at no great distance under the grauwacke, from this point to the neighbouring granite district of Mourne, and to this is owing the contortion of the incumbent strata. These indurated schists occupy by much the greater portion of the county. Limestone is found towards the S., where Cavan borders on the central limestone plain of Ireland, but the quantity is very small. The whole county is rich in minerals. At Swanlinbar and Quilca, among the Ballynageeragh Mountains, are mines of coal and iron; lead and silver ore have been discovered near Ballyconnell in the same district; lead and copper occur near Cootehill; coarse manganese and ochres are found in different parts of the county in abundance. A strong vein of blind coal occurs at Shercock on the E. of the county, and at Ballyjamesduff, a village between Virginia and Cavan, indications of a vein of very good quality have been discovered. Excellent marl, fuller's earth, potter's clay, and brick-clay are abundant throughout the county. There are numerous mineral springs, particularly at Swanlinbar and Kingscourt. The latter place is situated on the eastern border of the county. The spring feeds a remarkable lake on the summit of an adjacent hill. The lake is about half a square rood in area, has no outlet, preserves a constant level, and never freezes. The water for about six feet from the surface is pure and clear, but lower down becomes gradually more and more muddy, until at a depth of about thirty feet it approaches to the consistence of tar. In this mud the healing virtue of the spring is supposed to reside, and it has been found particularly efficacious applied as poultices in scorbutic complaints. The depth has never been ascertained, but the pool is considered by the vulgar to be unfathomable. On the plain below is a chalybeate spring, which is also resorted to by invalids, but has no connexion with the pool above. The name of this pool in Irish is *Lough-an-leighagh*.

The soil of Cavan is described as being naturally cold, spongy, and inclined to rushes, but with proper draining and manuring it can be rendered highly productive. In the district watered by the Erne and its feeders the crops are luxuriant, and the face of the country rich and pleasing. In the mountainous country nothing can be poorer; plough-husbandry is totally unknown, and the crops, which consist of potatoes and a poor sort of black oats, are put in with a narrow-bladed spade called a *sloy*. In this part of the county there are few roads, and the slide car is still in general use. In both districts the dry stone fence is almost universal, quick and thorn hedges being only found in the farms of the wealthy or in the demesnes of the great resident proprietors. Such demesnes are however numerous, and some of them, particularly those of Lord Farnham near Kelleshandra, and of Mr. Coote at Bellamont Forest, near Cootehill, are of great extent and of remarkable beauty. The farms in general are very small: this has arisen chiefly from the combination of agricultural and manufacturing pursuits, in which the peasantry have long been engaged, each small farmer having until lately been more or less employed in linen-weaving.

In 1802 the bleach greens of this county were large enough to bleach 91,000 webs of linen at a time, which, if in full employment, would employ a capital of 45,500*l.* This trade has declined here for some time back, but its revival in Antrim and Down is likely to render it again the staple trade of all Ulster. The ground in the lowlands is chiefly under tillage, but there is little wheat grown; potatoes, oats, and flax are the principal crops raised. Grain is almost universally sown in ridges, in consequence of the wetness of the soil. The corn-mills are small, and for the most part attached to the several estates, as manor mills, at which the tenants are obliged by their leases to grind. The breed of cattle is poor; but great exertions have been made of late by spirited resident proprietors to introduce an improved stock, as well as to better the system of farming by the example of green crops and stall feeding. Grazing is not pursued to any extent; and the wool worn in frieze by the peasantry is chiefly brought in a manufactured state out of Connaught. On the whole, Cavan is an improving county, and from the peaceful and industrious character of the people is likely to continue so.

Cavan is divided into eight baronies, viz., Tullaghaw, comprising the mountainous district on the N.W.; Tulla-[illegible] on the S.W., containing Killeshandra, a neat town with a good linen market (population, 1139); Clonmoghan and Castleraghan on the S., the latter with the small towns of Ballyjamesduff (pop 863) and Virginia (pop. 930); Clonchee on the E., with the towns of Bailieborough (pop. 1085) and Kingscourt (pop. 1616): Tullaghgarvey on the N.E., with the thriving town of Cootehill (pop. 2239); Upper Loughtee on the N., with Belturbet (pop. 2026); and Lower Loughtee in the centre, with Cavan, the county town, a neat but small place, with a good gaol, court-house, and barracks, and a pop. of 2[illegible]. Cavan town is a decayed corporation, which formerly returned two members to the Irish parliament, for the loss of which franchise, Theophilus Clements and Thomas Nesbitt, Esqs., received 15,000*l.* compensation at the Union. Belturbet was also a corporate town, but is similarly decayed. Cavan county contains 33 parishes, of which 29 are situated in the diocese of Kilmore, 3 in that of Ardagh, and 1 in that of Meath. The population of the county in 1831 was 113,174 males and 114,759 females; total, 227,933, forming 40,328 families, of which 31,081 were chiefly employed in agriculture, 4462 in trade, manufactures, and handicraft, and 4785 not included in either denomination; the number of inhabited houses was 38,917; of uninhabited houses, 1044: and of houses building, 488. The general proportion of religious denominations, as ascertained from the diocese of Kilmore, with which Cavan is nearly co-extensive, is about five Roman Catholics to one Protestant.

Cavan was anciently called Breifne (*Brenny*), by which name it is distinguished in the history of the Conquest, as being part of the territory of O'Rourke, the seduction of whose wife by Dermot Macmurrogh was the proximate cause of Strongbow's invasion. It continued in the possession of the O'Reillys, a clan tributary to O'Rourke, down to the reign of Elizabeth, when the county was first made shire-ground by commissioners appointed by the lords justices (the Lord Chancellor Cusack and Sir Henry Wallop), about 1580.

On this occasion the boundaries of the baronies were fixed, and the whole county was divided among the native possessors, five baronies being allotted to different members of the O'Reilly family alone, with a reservation of 220 beeves as a chief rent to the crown. All the O'Reillys however having forfeited by rebellion, except Molmurry, who was killed on the queen's part at the battle of the Blackwater, and his daughter having failed in establishing her claim in consequence of certain informalities in the proceedings of the above commission, the whole of Cavan reverted *de jure* to the crown, although in fact held for some years after by the natives. It was not till 1610, when six other counties in Ulster were forfeited by the attainder of O'Donnell and O'Neill, that this escheat of Cavan was insisted on: and it is more than probable that, but for the design of a general plantation of Ulster, the objections to the former apportionment of the county would never have been urged. When proclamation was made that the natives should remove out of the precincts allotted to the British undertakers, a lawyer of the pale retained by them made an attempt to traverse the proceedings; 'for,' says Sir John Davies, 'the inhabitants of this country do border upon the English pale, where they have many acquaintances and alliances; by means whereof they have learned to talk of a freehold, and of estates of inheritance, which the poor natives of Fermanagh and Tyrconnell could not speak of, although these men had no other nor better estate than they: that is, only a scambling and transitory possession, at the pleasure of the chief of every sept.' Accordingly the Irish advocate attempted to show that although O'Reilly by his rebellion might have forfeited his chiefary and head-rents, yet his tenants who had not been in rebellion ought not on that account to be dispossessed of their holdings: arguing that these tenants at large had an inheritable interest in the land which no act of their chief could forfeit, and desiring leave for them to transfer the dues and duties forfeited by O'Reilly, to the crown, of which they sought to be tenants in his stead. To this the king's attorney-general (Sir John Davies) replied, by showing, that as O'Reilly had the power of levying exactions at pleasure on the country, no man subject to such arbitrary taxation could be considered a freeholder; and that, even though O'Reilly's exactions might have left a beneficial interest in the land to such a man, yet no member of a community in which the practice of gavelkind prevailed could be held to have an inheritable estate therein, and that therefore O'Reilly was the only inheritor and freeholder of the country his attainder necessarily left the whole county to be holden immediately of the crown, the inhabitants being disposable of solely at the king's pleasure. Further, he argued, that the king was not only entitled in law to seize the whole country, but that he was bound in conscience and justified in honour in so doing; first, for the advancement of his subjects in religion and civilization, and for the improvement of the soil, which neither Christian policy nor conscience could suffer longer to lie waste and unproductive; and, secondly, by the examples of many famous kings and nations who had planted similar colonies 'in imitation of the skilful husbandman who doth remove his fruit-trees, not with a purpose to extirpate and destroy them, but that they bring better and sweeter fruit after the transplantation.' With these arguments the natives were forced to be contented, and after stipulating for their new possessions on as liberal terms as they could obtain, vacated their former possessions to the extent of 52,324 English acres, of which about 38,000 acres were distributed among colonists of various denominations.

The introduction of a civilized and industrious population had soon the best effects in reclaiming the country, which up to this time had been waste and barbarous. Castles were built on all the chief undertakers' portions; the foundations of towns were laid at Virginia, Belturbet, and Ballyconnell, and of numerous considerable villages throughout all the low part of the county. The principal settlers were Hamiltons, Aughmuties, and Balies, from Scotland; Lamberts, Parsons, Ridgeways, and Butlers, from England and the pale; and of the reinstated Irish the chief were O'Reillys. There is very little interest connected with the subsequent history of Cavan. The forfeitures consequent on the wars, commencing in 1641 and ending in 1690, extended only to 3830 acres, principally the estate of the baron of Slane, and worth no more than 558*l.* 16*s.* per annum, in which respect property in this county has undergone less change of hands than in any other county of Ireland.

In point of antiquities this county is barren; there are the remains of numerous raths, tumuli, castles, and religious houses, but none of them of any extent or historical interest. On the hill of Quilca near Swanlinbar, in the N.W. of the county was formerly the place of inauguration for Macguire K[illegible] of Fermanagh, and the spot is still regarded with superstitious veneration by the peasantry of this rude district.

The number of schools in Cavan in 1824 was 346; educating 17,897 young persons, of whom 4948 were Protestants, and 12,866 were Roman Catholics. In 1821 the number of scholars was only 8806; so that the amount of education has been more than doubled here within the short space of three years. The value of the landed produce of the county has been calculated at 1,204,000*l.* per annum; the rental to proprietors at 101,890*l.* per annum; the average rent of land to proprietors at 6*s.* per acre per annum, and to occupiers at 30*s.* per annum. Savings' banks have not yet made any great progress here, nor has a local press been found successful. The county returns two members to the imperial parliament, and has a constituency of 2392 voters. Lords Farnham, Headfort, and Lanesborough, and the families of Maxwell and Coote, are the principal proprietors.

The county expenses are levied by grand-jury assessment. The state of the poor, although much less wretched than in many other counties, and notwithstanding numerous private charities, is still such as to make a provision for the destitute very desirable.

(*Statistical Survey of the County of Cavan*; Pynnar's *Survey*; *Parliamentary Reports and Papers*; *Trans. Geological Society*, vol. v.; and *Trans. of British Association*; Pettigrew and Oulton's *General Directory for Ireland*.)

CAVE, WILLIAM, an eminent scholar and divine, was born December 30th, 1637, at [illegible] in Leicestershire, where his father was rector of the parish. He was admitted at St. John's College, Cambridge, in 1653, took the degree of B.A. in 1656, and that of M.A. in 1660. In 1662 he was admitted to the vicarage of Islington in Middlesex, and some time after became one of the king's chaplains in ordinary. He took the degree of D.D. in 1672; and in 1679 was collated by the Archbishop of Canterbury to the rectory of Allhallows the Great, in Thames Street, London. In July, 1681, he was incorporated D.D. at Oxford; and in November, 1684, was installed canon of Windsor. He resigned his rectory of Allhallows in 1689, and his vicarage of

Islington in 1691, having on the 10th November, 1690, been admitted to the vicarage of Isleworth in Middlesex. He died at Windsor, on the 4th of August, 1713, and was buried in Islington Church, where a monument was erected to his memory. He published two single sermons, one preached before the Lord Mayor and citizens of London, November 5th, [illegible], 4to., London, [illegible]; the other, preached before the King, Jan [illegible] h. [illegible] iv. 7. 4to., London, [illegible]. His Works of greater importance are—1. 'Primitive Christianity,' in three parts, 8vo., London, 1672; reprinted several times since. 2. 'Tabulæ Ecclesiasticæ; Tables of the Ecclesiastical Writers,' fol., London, 167[illegible]; reprinted at Hamburg in 1676 without his knowledge. 3. 'Antiquitates Apostolicæ; or the Lives, Acts, and Martyrdoms of the Apostles,' fol., London, 1676; republished in 1702. 4. 'Apostolici; or the History of the Lives, Acts, Deaths, and Martyrdoms of those who were Contemporaries with or immediately succeeded the Apostles; as also of the most eminent of the Primitive Fathers for the first three hundred years: to which is added, a Chronology of the three first Ages of the Church,' fol., London, 1677. 5. 'Ecclesiastici; or the History of the Lives, Acts, Deaths, and Writings of the most eminent Fathers of the Church that flourished in the fourth century,' fol., London, 1682. 6. 'A Dissertation concerning the Government of the Antient Church,' 8vo., London, 1683. 7. 'A serious Exhortation, with some important Advices, relating to the late cases about Conformity, recommended to the Protestant Dissenters from the Church of England,' 4to., London, 1683. 8. 'Chartophylax Ecclesiasticus,' 8vo., London, 1685. 9. 'Scriptorum Ecclesiasticorum Historia Literaria a Christo nato usque ad Sæculum xiv. facili methodo digesta,' in two parts, fol., the first printed at London in 1688; the second in 1698; republished, fol., Col. Allob., 1705 and 1720. The best edition is that printed at the Clarendon press, by subscription, in two vols., fol., 1740—1743: it contains the author's last corrections and additions. Cave's 'Lives of the Apostles,' 'Lives of the Fathers,' and his 'Primitive Christianity, are justly esteemed the best books upon those subjects. (*Biogr. Britannica;* Chalmers's *Biogr. Dict.;* Nelson's *Hist. of Islington*, 4to., London, 1811, pp. 284, 285.)

CAVE, EDWARD, a printer to whom the literary world owes many obligations, was born at Newton in Warwickshire, February 29, 1691. He is principally known as the projector of the 'Gentleman's Magazine,' and as the friend and early patron of Dr. Samuel Johnson, who wrote an account of his life. He died January 10, 1754.

CAVEAT. As a general term in law, a caveat denotes a formal notice or caution given, by a party interested, to a court, judge, or public officer against the performance of certain judicial or ministerial acts. Thus caveats in this general sense were entered formerly in the Court of Chancery against the passing of a patent; and in the Court of Common Pleas against the levying of a fine. In a more confined and technical sense, a caveat signifies, 1. a caution entered in the Spiritual Court to stop the granting of probates of wills or of administrations; and 2. a notice given to the bishop by a party who disputes a particular right of presentation, to prevent the institution of a clerk to a benefice. A caveat in either of these cases is said to be binding (*servare jus illæsum*) by the canon law for three months; and a probate given, or an institution made, pending the caveat, has been considered as wholly void by that law. But the common law takes no notice whatever of a caveat, considering the proceeding not as the act of a superior authority, but merely in the nature of an *ex parte* caution or suggestion from a stranger for the information of the court or officer, in order to prevent wrong from being done. The better opinion therefore seems to be, that administration granted, or institution [illegible], notwithstanding a caveat, would be good at [illegible]. (Burn's *Ecclesiastical Law*, tit. 'Caveat;' Willi[illegible] *of Executors*, vol. i.)

CAVENDISH, or CANDISH, THOMAS, was the son of a gentleman of fortune in Suffolk. It appears from Harris that he was of age, and inherited his father's property in 1585, immediately after which he equipped a 'stout bark of [illegible]20 tons' on his own account, and accompanied the famous Sir Richard Grenville in his voyage to Virginia and the West Indies. His outlay on this voyage was a serious inroad into his fortune; he derived no profit from it, unless we consider in that light the wonderful accounts he heard in the West Indies of the exploits of Sir Francis Drake, who a short time before had plundered St. Domingo, Carthagena, and other Spanish settlements, and the encouraging prospect of 'such enriching' expeditions being easy of execution to a small determined force. According to some of his biographers, Cavendish, on his return from Virginia, still further reduced his property by becoming a courtier, and embarking in the extravagances of the gallants of Queen Elizabeth's days, and they state that his first grand voyage was undertaken (as the second undoubtedly was) to recruit his finances. The practice was common enough in his time, and men of rank and family thought it no disgrace to retrieve their fortunes by plundering on the Spanish Main. Their system seems to us to be little better than that of buccaneering: but the cruelties of the Spaniards almost justified even the buccaneers. In the days of Elizabeth too there was open war with Spain, and while that power sent armadas to invade England, it was quite fair that England should attack Spain in the richest and most exposed of her transatlantic colonies.

The expedition, which was mainly fitted out at the expense of Cavendish, who sold or mortgaged the remainder of his estates for the purpose, consisted only of three small vessels, one of 120 tons, one of 60, and the third of 40, and the united crews, men and officers, did not exceed 123. But the mind of every one of these adventurers was inflamed with ideas of wealth to be obtained in a predatory voyage against the Spaniards, and they had full confidence in the valour and generosity of their young commander. Cavendish embarked in the largest ship, and sailed from Plymouth on the 21st of July, 1586. Crossing the Atlantic, he ran along all the continent of South America, as far as the Straits of Magalhaens, into which he boldly sailed on the 6th of January, 1587. It took him thirty-three days to clear the Straits, but part of that time was well employed in surveying the coasts, rocks, &c., which were hitherto little known. As soon as he reached the Pacific Ocean (24th February) he turned northward, and soon came to the scene of action which he had selected as likely to furnish most booty. The men fought and plundered bravely, but not without suffering considerable loss. They burnt Paita, Acapulco, and other settlements on or near the coast, they took some Spanish ships, destroyed others, and ravaged the sea-board of Chili, Peru, and New Spain. But the crowning blow of the expedition, and that on which Cavendish counted for wealth and honour, was the capture of the annual galleon, the St. Anna, which was loaded with valuable merchandise, and contained 122,000 Spanish dollars in hard cash. This ship was 700 tons burden, and well manned, yet, after lying in ambush for her under Cape Lucas on the coast of California, the English, whose number, small at first, was greatly reduced by battle and sickness, attacked her, and carried her by boarding. After this Cavendish, starting from California, crossed the Pacific to the Ladrone Islands; from the Ladrones he sailed through the Indian Archipelago and the Straits of Java to the Cape of Good Hope; from the Cape he made for England, and he reached Plymouth on the 9th of September, 1588, having been absent no more than two years, one month, and a few days.

The circumnavigation of the globe had not before been performed in so short a time. In addition to dispatch, Cavendish had the merit of making some geographical corrections: he reduced to its proper length the distance from Java to the Cape of Good Hope, which the Portuguese had greatly exaggerated, and he did a good deal, as already stated, towards the hydrography of the Straits of Magalhaens. He was also the first to point out to the English the local advantages of St. Helena, which before had been resorted to only by the Portuguese. He touched at that island, which he described as a delicious place, then covered with trees. On his return from this voyage he wrote a curious letter to Lord Hounsdon, a chamberlain and favourite of Queen Elizabeth. After telling the courtier how he had gained victory over her majesty's enemies, he sums up, 'I burnt and sunk 19 sail of ships, small and great; and all the villages and towns that ever I landed at I burned and spoiled.' Elizabeth knighted the successful depredator, and from the portion of the spoils that fell to his share as capitalist and commander Sir Thomas Cavendish was said, in the language of the time, to have been 'rich enough to purchase a fair earldom.'

But in three years Cavendish was a poor man again, and to better his fortunes he once more turned his eyes to the New World. An expedition was prepared, not as formerly, by himself almost alone, but [illegible] joint-stock of money, bravery, and adventure—an [illegible] which dimini[illegible] his authority and proved fatal to discipline; for those who had contributed as much as he had, pretended to an equality of command with him. Quarrels and dissensions arose; and, in addition to this misfortune, the 'three tall ships and two barques,' which are said to have been well equipped, had to encounter tempests not met with in the former voyage. Their only success was the capture of the town of Santos in Brazil; but their reverses were numerous. Cavendish was obliged by the mutinous spirit of his men, to abandon his bold plan here. Worn out by disappointment and vexations of all kinds, the hardy navigator died at [illegible] on his return towards England in 1593. (Harris, *Collection of Voyages and Travels.*)

CAVENDISH, HENRY. The materials for the personal life of Cavendish are as yet extremely scanty. We have found very little in the 'Gentleman's Magazine for 1810,' and much more in the 'Biographie Universelle,' from the pen of M. Biot, an excellent authority as to the scientific part; but as he does not state his source of information as to the details of private life, we inclose what we have taken from thence in [ ].

Henry Cavendish was the younger son of Lord Charles Cavendish, the brother of the great-grandfather of the present Duke of Devonshire, and was born October 10, 1731. [He had originally a very moderate fortune, and his relatives were estranged from him by his determination not to enter upon public or political life; with the exception of an uncle, who, on his return from abroad in 1773, not being pleased with the conduct of the family towards Cavendish, made the latter heir to his fortune, which was very large.] Cavendish devoted himself to mathematics and chemistry, to which his attention was probably turned by his father, who was himself a cultivator of the sciences; but his success, or at least its evidence did not come very early, for he was more than 35 years of age before he published any thing. He lived a retired life, and never married; his manners seem to have been eccentric, and to strangers very reserved. [His library was immense, and he fixed it at a distance from his own residence, that he might not be disturbed by those who came to consult it. His friends were allowed to take books, and he himself never withdrew a book without giving a receipt for it.] He died February 24, 1810, leaving more than a million sterling among different relations. The few accounts of him which have been published in England contain the usual quantity of praise; but nothing to mark any particular point of character. Of Cavendish as a philosopher, those who judge by the quantity of brilliant discoveries will not be able to form any opinion. His writings consist of a few papers in the 'Philosophical Transactions,' from 1766 to 1809. But in these papers we find methods and results which have occasioned his being sometimes called the Newton of Chemistry. Without such hyperbole, it may safely be said that he was the first, and one of the most useful, of those who laid the foundation of the science in its modern form. At the time when his first paper appeared, pneumatic chemistry had hardly an existence. It is true that different gases were known, that is, had been obtained as results of chemical processes; but they were not recognised as distinct substances. It was thought they consisted of common air mixed with foreign matter; and it was not imagined, for instance, that the *inflammable* air produced by operating with one substance was the same as that from another. In 1766, Cavendish for the first time asserted and demonstrated that the fixed air (carbonic acid gas) was the same, whatever was the substance from which it was derived, and the same for the inflammable air (hydrogen), and that neither had the specific gravity of common air. He investigated for the first time the principal properties of the latter [illegible] noticed the moisture which results from its com[illegible] in 1784, he completed the synthetical formation of wa[illegible] that is he found the moisture above mentioned to b[illegible] [illegible]ple water, and discovered that the remaining elemen[illegible] now therefore called *nitrogen*, was the constituent [illegible] [illegible]ric acid. He produced this substance by passing the electric spark through air over mercury, and saturating the result with a solution of potash, by which he obtained nitrate of potash, commonly called nitre. The well-known experiment for the determination of the earth's density has been described in ATTRACTION; see also Density of the EARTH. Cavendish also wrote on the civil year of the Hindus, and on the division of ast[illegible] [illegible]ments, and va[illegible]rs on [illegible].

We resist the [illegible]tation to swell this article to an extent proportionate to what the reputation of Cavendish deserves. The fundamental [illegible] his chemical results has [illegible] of any other discoverer in chemistry [illegible] fame for the great accuracy of his experiments, and the (then) une[illegible] soundness of his views. One writer asserts that every sentence he has written [illegible] microscopic examination. A French writer [illegible] (we should say affirms) that he furnished Lavoisier with the materials of his system; and Sir Humphry Davy, in a lecture delivered shortly after the death of Cavendish, [illegible] as follows: 'His processes were all of a finished nature, perfected by the hand of a master; they [illegible] no correction; and though many of them were performed in the very infancy of chemical science, yet their accuracy and their beauty have remained unimpaired amidst the progress of discovery.' The discoveries of Cavendish were [illegible] he formed his substances both by analysis and [illegible], ascertained that the weight of his product was the sum of that of its components, and determined its specific gravity. He was the first who carried the mind and methods of a mathematician into the field from which the alchem[illegible] not long retired, and in which the speculator still remai[illegible] And when we say the mind and methods of a mathematician, we do not deny that the inductive philosopher had already been there; but it was to remark phenome[illegible] not to measure quantities.

CAVERY, a river in the south of India, w[illegible] the Coorg country among the Western Ghauts, near the coast of Malabar, in 12° 20′ N. lat., 4000 feet above the sea. It is not navigable, except for small boats. Its course is at first for a few miles to the N.E.; it then flows E.S.E. to Seringapatam, soon after which its course is more directly E., until it enters the Barramahal districts, after which, running nearly due S., it forms the eastern boundary of Coimbatore, towards the Carnatic frontier. At Trichinopoly it is divided into several branches, the most northern of which, under the name of the Coleroon, after a north-easterly course of about 80 miles, in which it forms the division between the southern and central Carnatic, falls into the sea at Devicotta. The whole course of the river is about 450 miles. The southern branches retain the original name of Cavery, and by means of canals and embankments are employed to fertilize the plains of Tanjore, which present one vast field of rice cultivation.

At Seringapatam, the Cavery forms [illegible] island upon which the city is built. The river is here [illegible] and rapid, and its channel is filled with rocks and fragments of granite. A rude and massy aqueduct, [illegible] feet wide, has been constructed, in order to supply the town with water from the river. This aqueduct serves also the purpose of a bridge. In North Coimbatore, the Cavery forms another island, called Sivana Samudra, near to which are two cataracts of extraordinary grandeur. The cataract of Gangana Chuki occurs in the northern channel, where the water is precipitated over a perpendicular rock 200 feet high. By a projection from the rock, the fall is divided into two stages, the division being however scarcely discernible through the cloud of foam. The southern cataract is called Birra Chuki; the precipice over which the water falls is about 100 feet high, and forms part of the arch of a large circle down which the river is thrown in ten or twelve streams; that in the centre is the largest and most violent. The quantity of water in the river varies considerably, according to the season. The principal supply is de[illegible] from the rains in the Western Ghauts in the month of May. In July, the stream is again filled by the monsoon rains on the coast of Coromandel. [illegible]ing down of the floods from the interior is celebrat[illegible] [illegible] festivities by the inhabitants of the Southern [illegible] who justly attribute to it the fertility of their fiel[illegible]

(Buchanan's *Journey throu[illegible] Mysore*; Heyne's *Historical and Statistical Tracts on [illegible]a.*)

CAVIA. [GUINEA PIG.]

CAVIAR, (French, *Caviar*, *Cavial*; G[illegible], [illegible]*viar*; Italian, *Caviario*, *Caviale*; Spanish, *Caviar*[illegible] *Ikra*;) an article of food prepared in Russia from the roes of some large fish, generally the sturgeon. The greater part of the caviar is prepared near the mouths of the Volga, and also at the mouths of the Danube, Dnieper, and the Don. In [illegible] of March, the sturgeon arrives in great numbers [illegible] these places. The ovaria of the largest of [illegible] estimated to contain 3,000,000 of eggs; the [illegible] caught both with nets and with hooks. Caviar is [illegible] by removing from the roe all its membranes; it is [illegible] washed in vinegar or [illegible] and dried by being spread on a board in the air. [illegible] this, it is thoroughly [illegible] the salt [illegible] in with the hand; it is then [illegible] into a bag and pressed in order to remove the liquor; [illegible] is packed in kegs, and is then ready for sale. The [illegible] made on the shores of the Caspian is for the most part sent up the Volga to Moscow; that shipped from the ports of the Black Sea and Sea of Azof is bought at [illegible] by the Armenians of Nakhitchivan and the Greeks [illegible] anrog. The shipments from these ports, in [illegible] amounted to 45,852 poods, equal to 1,650,672 English pounds. This caviar is not so good as that which is made on the Caspian. The principal exports are to Italy; very [illegible] is brought to England. The shipments altogether [illegible] only a small part of what is made, the consumption in Russia being very great in consequence of the three seasons of fasting which occur in the year. When of good quality, caviar is dry and of a brown colour; it is commonly eaten with oil and lemon juice.

A similar substance, called botargo, is prepared on the coasts of the Mediterranean from the roes of a kind of mullet; the method of preparing it is very similar to that described above. (Tooke's *Hist of Russia*; De Hagemeister's *Report of the Commerce of New Russia, &c.*)

CAVOLI'NA. [Psilosomata.]

CAWNPOOR, a district in the province of Allahabad, between 26° and 27° N. lat. and 79° and 81° E. long., bounded on the N. by the Etaweh district, on the E. by the reserved territories of the King of Oude, on the S. by the Jumna, and on the W. by the Ganges. This district is situated in the Doab, or the tract between the Ganges and the Jumna; and it occupies a segment of the plain which extends from the bay of Bengal northward to the mountains. The soil of about two-thirds of this district yields abundant harvests of maize, barley, and wheat, besides turnips, cabbages, and other European garden vegetables, together with grapes, peaches, and several other fruits which have been introduced by European residents; the sugar cane also grows luxuriantly. Irrigation is much practised, and the number of wells sunk for that purpose is very great.

From a statistical report made in 1814, concerning this district, it appears that the number of villages which it then contained was 3439; its area 29,46,315 begas (nearly 1,000,000 [illegible]) of which 17,68,745 were cultivated, 1,34,189 fit for cultivation, and 10,43,381 begas were wholly unproductive. The government assessment amounted to 27,36,297 rupees (273,629*l.*), or about 9*s.* sterling per acre on the cultivated portion of the land; a very high assessment, which being subsequently found to be oppressive to the cultivators has been reduced.

The principal towns, besides Cawnpoor, the capital, are Resoulabad in 26° 40′ N. lat., and 79° 40′ E. long., about 30 miles S.S.W. from Kanoje; Jaujemow in 26° 26′ N. lat. and 80° 16′ E. long., eight miles S.S.E. from the town of Cawnpoor; and Akbarpore in 26° 23′ N. lat. and 79° 52′ E. long., 25 miles W.S.W. from Cawnpoor.

CAWNPOOR, the capital of the district, is situated on the right bank of the Ganges in 26° 30′ N. lat. and 80° 13′ E. long. Cawnpoor is one of the largest military stations in India. The old town stands a short distance N.W. of the modern buildings, and higher up the Ganges. The principal street is composed of well-built brick houses two or three stories high with balconies in front; the back parts of the town are built in a straggling manner and the houses are mean in size and appearance. There are many handsome shops in the principal [illegible] containing generally an abundant supply of E[illegible] which are nearly as cheap as at Calcutta; art[illegible] are not more than half the [illegible] [illegible] stationed at Cawnpoor, being obliged to provide their own quarters, have built their houses, or *bungalows*, along the banks of the Ganges. Each of these bungalows is a detached building with a garden and plantation, surrounded by an unsightly mud wall as a defence against cattle and thieves. In the rainy season the Ganges is more than a mile in breadth, but in the dry season the river is shallow and several sand-banks are visible in its bed. At this dry season, which lasts from October to June, a residence at Cawnpoor is extremely [illegible] owing to the suffocating heat of the climate and the dust. 'T[illegible] history of the country,' says Dr. Tennant, 'affords many instances of battles lost or won by the direction of the dust; a windward position giving an army an advantage somewhat similar to the weather-gage in an action at sea.' For this reason all the houses of Europeans have glass windows, and officers are provided when they march with a frame of glass which they fix in the door of their tents. (Tennant's *Indian Recreations*; *Report of Committee of House of Commons on Affairs of India.*)

CAXTON, WILLIAM, to whom England owes the introduction of printing, was born, according to his own statement, in the Weald of Kent. Of the date of his birth nothing is known with certainty, though Oldys places it in 1412. Lewis and Oldys suppose that between his 15th and 18th years he was put apprentice to one Robert Large, a mercer or merchant of considerable eminence, who was afterwards successively sheriff and lord mayor of London and who, upon his death, in 1441, remembered Caxton in his will by a legacy of 20 marks. Caxton, at this time, had become a freeman of the Company of Mercers. His knowledge of business however induced him, either upon his own account or as agent of some merchant, to travel to the Low Countries for a short time. In 1464 we find him joined in a commission with one Robert Whitehill, to continue and confirm a treaty of trade and commerce between Edward IV. and Philip, duke of Burgundy, or, if they found it necessary, to make a new one. They are styled in it ambassadors and special deputies. This commission at least affords a proof that Caxton had acquired a reputation for knowledge of business. Seven years afterwards Caxton describes himself as leading a life of ease, when, 'having no great charge or occupation,' he set about finishing the translation of Raoul le Fevre's 'Recueil des Histoires de Troye,' which he had commenced two years before, in 1469. The original was the first book he printed, and this translation the third. Of Caxton's pursuits and travels abroad we know little more than that in his peregrinations he confined himself, for the most part, to the countries of Brabant, Flanders, Holland, and Zealand, and finally entered into the service, or at least the household, of Margaret duchess of Burgundy, who encouraged him to finish his translation of Le Fevre's 'History of Troy,' assisted him with her criticisms upon his English, and amply rewarded him upon the completion of his labour. From the prologues and epilogues of this work we discover that he was now somewhat advanced in years, and that he had learnt to exercise the art of printing, but by what steps he had acquired this knowledge cannot be discovered; his types only show that he acquired it in the Low Countries; he does not appear to have seen any of the beautiful productions of the Roman, Venetian, and Parisian presses before he had caused his own fount of letters to be cut.

The original of Raoul's History, the Oration of John Russell on Charles Duke of Burgundy being created a Knight of the Garter, and the Translation of Raoul, were, as far as we know, Caxton's three first works: the last finished in 1471. A Stanza by Wynkyn de Worde notices an edition of Bartholomæus de Proprietatibus Rerum as printed by Caxton at Cologne (about 1470), but the actual existence of this edition is unknown. Nor has more certain information yet been obtained of the exact period of Caxton's return to his native country. The usual supposition has been that he brought the art of printing into England in 1474, and that this date is indicated by the figures which are united in the centre of his *device* as a printer. In 1477 however he had undoubtedly quitted the Low Countries and taken up his residence in the vicinity of Westminster Abbey, where and in which year he printed his 'Dictes and Sayings of the Philosophers.' Stowe says he first exercised his business in an old chapel near the entrance of the Abbey; but a very curious placard, a copy of which, in Caxton's largest type, is now at Oxford in the late Mr. Douce's library, shows that he printed in the Almonry. It is as follows: 'If it plese any man spirituel or temporel to bye ony pyes of two and thre comemoracions of Salisburi use enprynted after the forme of this present lettre whiche ben wel and truly correct, late hym come to Westmonester in to the Almonesrye at the reed pale and he shal have them good chepe. Supplico stet cedula.' According to Bagford, Caxton's office was [illegible] removed to King-street.

[illegible] evidence of Wynkyn de Worde in the colophon [illegible] edition of 'Vitas Patrum,' 149[illegible] it appears that these

Lives of the Fathers were 'translated out of French into English by William Caxton of Westminster, lately dead,' and that he finished the work 'at the last day of his lyfe.' His death however seems fixed, by two or three entries in the parish accounts of St. Margaret Westminster, to the year 1491 or 1492, in which we read '*Item; atte bureyng of William Caxton for* iiij. *torches* vj^{s}. viij^{d}. *Item;* for the belle *at same Bureyng,* vj^{d}.' Wynkyn de Worde no doubt referred to this time.

Caxton, Mr. Warton observes, by translating, or procuring to be translated, a great number of books from the French, greatly contributed to promote the state of literature in England. In regard to his types, Dr. Dibdin says, he appears to have made use of five distinct sets, or founts of letters, of which, in his account of Caxton's works, he has engraved plates in fac-simile. Edward Rowe Mores, in his 'Dissertation upon English Typographical Founders and Founderies,' says Caxton's letter was originally of the sort called *Secretary,* and of this he had two founts; afterwards he came nearer to the *English face,* and had three founts of *Great Primer,* a rude one which he used anno 1474, another something better, and a third cut about 1482; one of *Double Pica,* good, which first appears 1490, and one of *Long Primer,* at least nearly agreeing with the bodies which have since been called by those names. All of Caxton's works were printed in what are called black letter.

The following is probably as complete a list as can now be recovered of the productions of Caxton's press:—1. 'Le Recueil des Histoires de Troyes,' compose par raoulle le feure, chapellein de Monseigneur le duc Philippe de Bourgoingne en l'an de grace mil cccclxiiii. fol. 2. 'Propositio clarissimi Oratoris Magistri Johannis Russell, decretorum doctoris ac adtunc Ambassiatoris Edwardi Regis Anglie et Francie ad illustr. Principem Karolum ducem Burgundie super susceptione ordinis garterij, &c.' 4to. 3. 'The Recuyell of the Historyes of Troye,' composed and drawen out of diverce bookes of latyn into Frensshe by Raoul le ffeure in the yere 1464, and drawen out of frensshe in to Englisshe by William Caxton at the commaundement of Margarete Duchess of Bourgoyne, &c., whyche sayd translacion and werke was begonne in Brugis in 1468 and ended in the holy cyte of Colon 19 Sept. 1471, fol. 4. 'The Game and Playe of the Chesse,' translated out of the French, fynysshid the last day of Marche, 1474, fol. 5. A second edition of the same, fol. (with wood-cuts). 6. 'A Boke of the hoole Lyf of Jason,' (1475) fol. 7. 'The Dictes and notable wyse Sayenges of the Phylosophers,' transl. out of Frenshe by lord Antoine Wydeville Erle Ryuyeres, empr. at Westmestre, 1477, fol. 8. 'The Morale Prouerbes of Cristyne (of Pisa), fol., 1478. 9. 'The Book named Cordyale; or Memorare Novissima,' which treateth of 'The foure last Things,' begun 1478, finished 1480, fol. 10. 'The Chronicles of England,' Westm., 1480, fol. 11. 'Descripcion of Britayne,' 1480, fol. 12 'The Mirrour of the World or thymage of the same,' 1481, fol. 13. 'The Hystorye of Reynart the Foxe,' 1481, fol. 14. 'The boke of Tullius de senectute, with Tullius de Amicitia, and the Declamacyon, which laboureth to shew wherein Honour sholde reste,' 1481, fol. 15. 'Godefroy of Boloyne; or, the laste Siege and Conqueste of Jherusalem,' Westm., 1481, fol. 16. 'The Polycronycon,' 1482, fol. 17. 'The Pylgremage of the Sowle:' transl from the French, Westm., 1483, fol. 18. 'Liber Festivalis, or Directions for keaping Feasts all the Yere,' Westm., 1483, fol. 'Quatuor Sermones' (without date), fol. 20. 'Confessio Amantis,' that is to saye in Englisshe, 'The Confessyon of the Louer,' maad and compyled by Johan Gower, squyer, Westm., 1483, fol. 21. 'The Golden Legende,' Westm., 1483, fol. 22. Another edition of 'The Legende,' sm. folio. 23. A third, fin. at Westmestre, 20th May, 1483, fol. 24. 'The Booke callid Cathon' (Magnus), transl. fr. the French, 1483, fol. 25. 'Parvus Chato' (without printer's name or date, but in Caxton's type), folio. 26. 'The Knyght of the Toure,' transl. from the French; Westm. (1484), fol. 27. 'The Subtyl Historyes and Fables of Esope,' transl. from the French, 1484, fol. 28. 'The Book of the Ordre of Chyvalry, or Knyghthode,' transl. from the French (assigned to 1484), fol. 29. 'The Book ryal; or the Book for a Kyng,' 1484, fol. 30. 'A Book of the noble Hystoryes of Kynge Arthur and of certen of his Knyghtes,' which book was reduced in to Englysshe by syr Thomas Malory Knyght, 1485, fol. 31. 'The Lyf of Charles the Grete Kyng of Fraunce and Emperour of Rome,' 1485, fol. 32. Another edition of the same, 1485, fol. 33. 'Thystorye of the noble ryght valyaunt and wo[illegible] [illegible]te Parys and of the fayr Vyenne, the doulphyns dou[illegible] of Vyennoys,' transl. from the French, 1485, fol. 34. [illegible] of [illegible] Maners,' 1486, fol. 35. 'The Doctrinal of [illegible]e,' tran[illegible] from the French, 1489, fol. 36. 'The Book of Fayttes of Armes and of Chyvalrye,' a translati[illegible], the first part of Vegetius de Re Militari, 1489, fol. [illegible] 'The Arte and Crafte to knowe well to dye,' transl. [illegible] French, 1490, fol. 38. 'The Boke of Encydos, compyled by Vyrgyle,' translated from the French, 1490. fol. 39. 'The Talis of Caunterburye' (no date), fol. 40. Another edition (without date or place), fol. 41. 'Infancia Salvatoris,' 4to. 42. 'The Boke of Consolacion of Philosophie,' whiche that Boecius made for his comforte and consolacion (no date nor place), fol. 43. A collection of Chaucer's and Lydgate's minor Poems, 4to. 44. 'The Book of Fame, made by Gefferey Chaucer,' fol. 45. 'Troylus and Creseyde,' fol. 46. 'A Book for Travellers,' fol. 47. 'The Lyf of St. Katherin of Senis,' fol. 48. 'Speculum Vite Christi; or the myrroure of the blessyd Lyf of Jhesu Cristo,' fol. 49. 'Directorium Sacerdotum: sive Ordinale secundum Usum Sarum, Westm., fol. 50. 'The Worke (or Court) of Sapience,' composed by John Lydgate, fol. 51. 'A Boke of divers Ghostly Maters,' Westm., fol. 52. 'The Curial made by Maystre Alain Charretier,' transl. from the French, fol. 53. 'The Lyf of our Lady, made by Dan John Lydgate, monke of Burye,' fol. 54. 'The Lyf of Saynt Wenefrydo,' reduced into Englysshe, fol. 55. 'A Lytel Tretise, intytuled or named The Lucidarye,' 4to. 56. 'Reverendissimi viri dni.' Gulielmi Lyndewodi, LLD. et epi Asaphensis, constitutiones provinciales Ecclesiæ Anglicanæ,' 24mo. 57. 'The Historye of Kynge Blanchardyne and Queen Eglantyne his wyfe,' fol. 58. 'The Siege of the noble and invyncible Cytee of Rhodes,' fol. 59. 'Statuta apud Westmonasterium edita, anno primo Regis Ricardi tercii,' fol. 60. 'Statutes' made in the 1st, 2nd, and 3rd Parliaments of Henry VII., folio. (The only fragment of this work known consists of two leaves.) 61. 'The Accidence,' (mentioned in one of the sale catalogues of the library of T. Martin of Palgrave.) 62. 'The Prouffytable Boke of mānes soule, called The Chastysing of Goddes Chyldern,' fol. 63. 'Horæ,' &c., 12mo., a fragment of eight pages now at Oxford, in the library bequeathed to the Bodleian by the late F. Douce, Esq. 64. A fragment of a Ballad, preserved in a volume of scraps and ballads in the British Museum.'

Dr. Dibdin has included, among the printed works of Caxton, 'Ouyde his Booke of Metamorphose,' translated and fynysshed by me William Caxton at Westmestre the xxij. day of Apryll, the yere of our lord M.iiij. C.iiij^{xx}. And the xx yere of the regne of Kyng Edward the fourth,' but it remains in manuscript only, as far as is known, in the Pepysian collection now deposited in Magdalen College, Cambridge, and consists of the last five books of the 'Metamorphoses' only. (Lewis's *Life of Caxton,* 8vo., Lond., 1737; Oldys' account of him in the *Biographia Britannica;* Warton's *Hist. Engl. Poetry;* the first volume of Dibdin's edit. of Ames's *Typogr. Antiquities;* and Chalmers's *Biogr. Dict.*) The two largest assemblages of the productions from Caxton's press now known, are those in the British Museum, and in Earl Spencer's library at Althorpe. The titles given in the present article have been collated with the books in the former of these collections.

CAYENNE. [Guiana.]

CAYENNE PEPPER. [Capsicum.]

CAYLUS, COUNT, was born at Paris in 1692. He entered the army in his youth, and made some campaigns in Catalonia and in Germany. After the peace of Rastadt, he turned his attention entirely to the fine arts and went to Italy for the purpose of studying them. He afterwards went to Constantinople and Asia Minor, and visited the ruins of Ephesus and Colophon. On his return to France, he applied himself to engrave and illustrate the cameos and other stones of the king's cabinet, and to superintend the publication of the fine work 'Pierres gravées du Cabinet du Roi,' in two vols. folio, [illegible]iptive of that collection. He also published engravin[illegible] the medals of the Roman Emperors belonging to the same collection: 'Numismata aurea Imperatorum Romanorum e Cimelio Regis Christianissimi.' In 1731 he was made a member of the Academy of Sculpture and Painting, upon which he wrote the lives of the most celebrated painters and sculptors who had belonged to that society. He caused the drawings of Santo Bartoli, of Rome, which are representations of antient paintings and mosaics, and form a very valuable collection of antient art, to be engraved and coloured. ‘Recueil de peintures antiques imitées fidèlement pour les couleurs et pour le trait d'après les desseins coloriés faits par P. Santo Bartoli,’ fol., Paris, 1757. The engravings are beautifully executed. The celebrated mosaic pavement of Palestrina is among them. In 1742 he was made a member of the Academy of Inscriptions, for which he wrote numerous memoirs on antient monuments, on antient paintings, on the Egyptian obelisks, on mummies, papyrus, &c. He collected numerous antiques, and published the result of his investigations in his great work, ‘Recueil d'Antiquités Egyptiennes, Etrusques, Grecques, Romaines, et Gauloises,’ 7 vols. 4to. The last volume was published in 1767, after his death; it contains a biographical notice of the author, by Le Beau. Caylus wrote also ‘Nouveaux Sujets de Peinture et Sculpture,’ 12mo., 1755; ‘Mémoire sur la Peinture à l'Encaustique,’ 8vo., 1755, which is a revival of the method of encaustic painting of the antients. He found out the means of incorporating the colour with stone. The art of encaustic painting has been practised since chiefly upon slate (that of the antients appear to have been upon wood), by Bachelier, Requeno, Fabbrini, and Parenti, the two last of whom are Florentine artists. (*Saggi sul Ristabilimento dell' antica Arte de' Greci e Romani Pittori*; Parma, 1787, and also ‘*Notes* to Winckelmann,’ vol. ii., p. 80.) Caylus wrote several novels, which have no very great merit. He died at Paris, in 1765. He was a warm, and, as far as it was in his power, a liberal promoter of the arts; extremely disinterested himself, he sought out and assisted indigent talent. He left his rich collection of antiquities to the King's Museum. In 1805 a compilation of memoranda was published, under the title of ‘Souvenirs du Comte de Caylus,’ 2 vols. 12mo.

CAYMANS, three islands lying to the westward of Jamaica, from which the nearest is distant 72 miles. The largest and westernmost is called the Grand Cayman; the next, Little Cayman; and the easternmost, Cayman Brack. They are contained between the parallels of 19° 10′ and 19° 45′ N. lat., and the meridians of 79° 30′ and 81° 35′ W. long. Grand Cayman is 24 miles long and 2½ broad; it is low and covered with trees, chiefly cocoanut. On the western side is a large village, called George's Town; but the other portion of the island is thinly inhabited. There are among the inhabitants many descendants of the old buccaneers. Produce is raised more than sufficient for their own consumption, and vessels touching here may obtain supplies; but there are no cattle or sheep, and water is scarce. The climate is considered healthy. The natives employ themselves chiefly in catching turtle, for the supply of Jamaica and other islands.

Little Cayman and Cayman Brack are small, low, barren, and uninhabited. (*Columb. Navigator*, and *Recent Surveys.*)

CAYOPOLLIN. [OPOSSUM.]

CAYOU. [ATELES, Species 3.]

CEBES, a Theban philosopher, and a disciple of Socrates. He was the writer of three dialogues, called ‘Πίναξ’ (table or tablet), ‘Ἑβδόμη,’ and ‘Φρύνιχος.’ (Suidas v. Κέβης. Diog. Laërt. ii. 125.) He is represented by Plato as attending Socrates in his last moments, and is one of the interlocutors in the *Phædon*. The first mentioned of his dialogues has been very frequently edited, and is often one of the first books placed before the Greek student. It is a description of an allegorical picture, supposed to be affixed to the walls of a temple of Saturn, and representing the life and trials of mankind. Scholars have doubted whether it is rightly attributed to the Theban Cebes, but the Greek authorities are conclusive of its genuineness (see Lucian, tom. i. p. 702, and tom. iii. p. 5 Hemsterhuis); and the Attic dialogue in which it is written is no proof that its author was not a Theban, for [illegible] dialogues were always written in Attic, just as the Ionic dialect was appropriated to the epos, and the Doric to lyric poetry. We know nothing of Cebes beyond the mention of his name by Plato, who makes Socrates call him a diligent inquirer after truth, and by Xenophon, from whom we learn that his moral character was most unexceptionable. The first complete edition of the ‘Πίναξ’ is that by J. Gronovius, Amstel. 1689; the best are, perhaps, that by Schweighäuser, Lips. 1798, which also contains the Manual of Epictetus; and his last edition of 1806.

There was a Cebes of Cyzicus, a Stoic philosopher contemporary with the Emperor Marcus Aurelius, to whom some critics, apparently without much reason, would attribute the ‘Table.’

There is a dissertation on the genuineness of the ‘Table,’ by F. G. Klopfer, Zwickau, 1818, 4to.

CEBRIONITES (Latreille), a family of Coleopterous insects, of the section Malacoderma. Technical characters:—Body generally somewhat oval and convex; wing cases rather soft and flexible; thorax broader than long, widest at the base, and with the hinder angles acute, or produced into a spine. Antennæ generally longer than the head and thorax; mandibles terminating in a simple point; joints of the palpi of nearly equal thickness; legs moderate, not contractile.

The species of this family are frequently found upon plants in marshy situations, but very little is known of their habits; their larvæ are supposed to live in the ground, and very probably subsist on the roots of plants.

The genus *Cebrio* is distinguished from other genera of this family by having all the joints of the tarsi entire, and without any velvet-like pellets beneath, and the posterior thighs of the same size as the anterior. About ten species of this genus have been discovered, most of which are peculiar to Europe. *Cebrio gigas*, a species not uncommon in France, is about three quarters of an inch in length, and of a pale brownish-yellow colour. In the male the head and thorax and the legs (excepting the thighs) are black; the head and thorax are thickly punctured, and, together with the elytra, which are striated, are covered with small yellowish hairs; the antennæ are long, and if extended backwards would reach about half way down the elytra. In the female there is so striking a difference in this organ, as to cause that sex to be mistaken for a distinct species: here the antennæ are very short, and if extended backwards would not reach farther than the base of the thorax; the basal joint is much longer than the other. the fourth and following joints are short, thick, and joined closely together. The legs of the female are also shorter and thicker in proportion than in the other sex.

It is said that the European species of this genus appear in great numbers after heavy rains.

CEBUS. [SAPAJOU.]

CECIDOMY'IA, a genus of two-winged flies (order Diptera) of the family Tipulidæ. Technical characters:—Wings resting horizontally, and having three longitudinal nervures: head hemispherical: antennæ as long as the body, and generally twenty-four jointed, the joints hairy; (in the females fourteen-jointed;) the two basal joints short legs long, basal joint of the tarsi very short, second long.

Mr. Stephens, in his catalogue of ‘British Insects,’ enumerates twenty-six species of this genus. They are always of small size, and many of them deposit their eggs on the young buds of various kinds of plants, where the larva is hatched, and transforms them into galls, in which it subsists and undergoes its metamorphosis.

Cecidomyia salicina is common in France on willows in the month of May; it is of a blackish colour, covered with fine velvet-like hairs; the antennæ have twenty joints; the wings are slightly obscure and downy; length one-sixth of an inch.

This little fly fixes each of its eggs on a bud of the willow in the month of June. The bud at the time of its evolution, near the end of the month, instead of putting forth its branch, becomes enlarged at the base, and ultimately forms a gall in which the larva is lodged, nourished, and undergoes its metamorphosis: the larva is of a reddish-yellow colour, and assumes the pupa state in the winter, when the gall is become of a large size.

Other species of cecidomyia produce similar deformities upon various parts of many species of plants, and resemble in this part of their habits the *cynipidæ* among the *hymenoptera.*

Cecidomyia tritici (*Tipula tritici*, Kirby), an insect commonly known by the name of the ***Wheat-fly***, has occupied much of the attention of entomologists, particularly that of the Rev. W. Kirby, who has published two accounts of its habits in the Linnæan Transactions.

This little fly is about one-twelfth of an inch in length, and of a reddish-yellow colour; the wings are milk-white, and exhibit the prismatic colours in certain lights: the eyes are black.* The wheat-fly may be observed sometimes in the greatest abundance, flying about wheat-fields in the month of June. It generally makes its appearance about seven or eight o'clock in the evening. 'Although,' says Mr. Kirby, 'those insects are so numerous in the evening, yet in the morning not a single one is to be seen upon the wing; they do not however then quit the field which is the scene of their employment, [illegible] upon shaking the stalks of the wheat or otherwise disturbing them, they will fly about near the ground in great numbers. I found their station of repose to be upon the lower part of the culm with their heads upwards.' The fly totally disappears by the end of June. According to Mr. Kirby it is about eight o'clock in the evening that they deposit their eggs. This gentleman has seen as many as twelve specimens thus occupied at the same time on a single ear, and observes that these flies are sometimes so numerous that were all to lay their eggs, and these to hatch, one half of the grain would be destroyed.

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* In order not to confound this with other little flies which may be somewhat similar, it will be necessary to notice the generic characters given in the beginning of this article.

The eggs are deposited by means of a long pointed and contractile tube, or ovipositor, generally upon the interior valvule of the corolla, just above the stigmata, and it occasionally happens that the fly is unable to retract its ovipositor, and being thus held prisoner it dies.

About the middle of June the larvæ are hatched, and may be seen adhering to the lower end of one of the anthers, and sometimes immersed in the woolly summit of the germen, or in the interior of the valvulæ of the corolla. These larvæ are simple minute grubs without legs or any visible head, and of a yellowish colour, and their food consists of the pollen of the anthers, which it appears in the plants thus attacked is unfit for impregnation.

The pupæ are of a reddish colour, and in number bear no proportion to that of the larvæ. 'I have seen,' says Mr. Kirby, 'more than once, seven or eight florets in an ear inhabited by the latter, and sometimes so many as thirty in a single floret, seldom less than eight or nine, and yet I have scarcely ever found more than one pupa in an ear, and had to examine several to meet with that. * * * * The pupæ that I have observed have generally been somewhat attached to the grain, and, what is worthy of notice, I never observed them within those florets where the larvæ had taken up their residence; they seem invariably to choose for their habitation, in their immediate state, one where the grain is uninjured, to which they may attach themselves.'

In a field of fifteen acres (planted partly with white and partly with red wheat), which Mr. Kirby carefully examined, and which was much attacked by these insects, he calculated that the havoc done by them would amount to five coombs; he observed that the white wheat was most affected.

During Mr. Kirby's observations he discovered no less than three parasites among the Ichneumonidæ, on the larva of the insect in question, which accounts for the great difference between the number of larvæ and that of the pupæ.

For further information on this insect, we refer to the 'Transactions of the Linnæan Society,' vol. iv. (in which there are two papers on the subject), pp. 224 and 230, and vol. v. p. 96.

CECIL, WILLIAM, BARON BURLEIGH, was born at Bourne in Lincolnshire, September 13, 1520. His father was master of the robes to Henry VIII. He was placed successively at the grammar schools of Grantham and Stamford, and at the age of fifteen he was removed to St. John's College, Cambridge, where he was distinguished for the regularity of his conduct and the intensity of his application. At the age of sixteen he delivered a lecture on the logic of the schools, and three years afterwards another on the Greek language. At twenty-one he entered at Gray's-inn, and applied himself to the study of the law, the history of his own country, and especially the genealogy of its principal families. In August, 1541, he married a sister of Sir John Cheke, who died in the second year of their marriage, leaving one son, Thomas, afterwards earl of Exeter. In the same year, having successfully contended in an argument on the supremacy of the Pope and the Catholic Faith with two priests, chaplains of O'Neil the Irish chief, he was at the king's desire brought into his presence. Conceiving a favourable opinion of Cecil's abilities, the king, in order to secure his services, conferred upon him the reversion of the office of custos brevium in the Common Pleas; an office of considerable emolument, and which fell into his possession about five years afterwards. Shortly after the accession of Edward VI. Cecil married Mildred, daughter of Sir Anthony Cook, the director of the king's studies; which connexion, together with his acknowledged high talents and habits of application, and his known attachment to the principles of the Reformation, procured him the friendship of the lord protector, to whose [illegible] he had already been recommended by the Cheke [illegible]. In 1547 the lord protector appointed him his master of requests, an office not only of distinction but of great trust. In the same year he accompanied the lord protector in the Scotch expedition, and was present at the battle of Musselburgh. Cecil quickly acquired the esteem and confidence of the young king, and in the year 1548 was appointed secretary of state.

On the fall of the lord protector, Cecil was committed to the Tower, but was discharged after an imprisonment of three months; and in October, [illegible] was by the duke of Northumberland restored to his [illegible] knighted, and sworn of the privy council. It does not appear that he was in any way privy to the fall of his early patron the lord protector; but the extreme caution of his subsequent behaviour to his fallen friend borders closely on ingratitude.

Soon after his re-appointment as secretary of state, Cecil effected several important measures. The abolition of the exclusive privileges of the merchants of the Steelyard seems to have sprung from that large and enlightened policy which distinguished his whole career. He further proposed to abolish the staple or regular market for the wool and chief productions of England, then existing at Antwerp, and to open two free ports in England, [illegible]hampton, the other at Hull; [illegible] from the then [illegible] commercial knowledge, and the perplexities arising [illegible] intrigues, the plan was not accomplished.

Cecil took no part in Northumberland's designs for altering the succession to the throne on the death of Edward VI., though he affixed his name to the instrument of settlement as witness to the king's signature, at his earnest request. On Northumberland's march into Cambridgeshire Cecil joined Mary, who had already been declared queen, and by whom he was graciously received. Under the new reign he gave up his employments because he would not change his religion, but he did not join in the cabals of either party. He cultivated the friendship of many of Mary's ministers, and became attached to the party of Cardinal Pole, who, in opposition to Gardiner, advised moderation and mildness in matters of religion.

Being chosen in 1555 one of the members for his native county, he distinguished himself by his opposition to the measures of the Catholic party. The [illegible]on of the bill for confiscating the estates of such as had quitted the kingdom on the score of religion is mainly attributed to him. In consequence of his conduct on this occasion he was summoned before the privy council, but he made so satisfactory a defence that he escaped committal to the Tower; a fate which befel those who were summoned with him. He, however, continued in that and the next parliament to advocate the cause of the persecuted Protestants. Foreseeing that Mary could not long survive, Cecil opened a private correspondence with the Princess Elizabeth, and enabled her by his communications and counsel to avoid the snares of the vindictive and suspicious Mary. On the very day of Elizabeth's accession he presented to her a paper setting forth twelve affairs which required immediate dispatch; which particulars, it is remarkable, formed the basis of his chief measures throughout his long administration. He was the first person sworn of the privy council in the new reign, and was forthwith appointed secretary of state. From this time until the close of his life Cecil directed the affairs of England. A full account of his life would be the history of the reign of Elizabeth. Vain, mean, and capricious as the queen was, her sound judgment enabled her to see the true value of Cecil, and induced her on many occasions to yield to his cool and dispassionate reasonings. In 1571 Cecil was created Baron Burleigh, in 1572 he received the order of the Garter, and in the same year succeeded the Marquis of Winchester as lord high treasurer; in which office he continued till his death. These honours may seem but an inadequate reward for Cecil's services, but the peerage in the reign of Elizabeth was a mark of the highest favour, and a token of real merit. Except in the instance of Leicester, no example perhaps occurs in that reign of a title acquired without desert. It is impossible within the limits of this article to notice even [illegible] cipal measures promoted by this great minister, [illegible] branch of his policy, whether in relation to religion [illegible] then formed so material a part of European affairs, the inte[illegible]ernment of England, or her foreign policy, he [illegible] by fixed and well grounded principles and [illegible] administration appears to have been produced by m[illegible] temporary expediency only, but to have formed a [illegible] consistent and well considered plan. Caution and intri[illegible] were necessary in an age when negotiation was a system of duplicity. Few ministers have been exposed to more acrimonious attacks than Lord Burleigh. The favourites of the queen were at all times opposed to his judicious and economical policy. The frequent plots occasioned by the rancorous excitement of religious feeling—the disputes fostered by the unsettled state of the succession—the chivalrous feeling excited and produced by Mary queen of Scotland and her [illegible]ns—and the capricious and hypocritical conduct of E[illegible]th, herself secretly approving and publicly blaming her minister, and holding him up to screen herself from public disapprobation—all conduced to embarrass his plans and confound his operations. But the accurate information which Lord Burleigh at all times obtained, his vigilance, his unceasing application, and unimpeachable integrity, enabled him to overcome the difficulties which surrounded him, and to [illegible] end of his career to retain the favour of the queen and the respect and affection of her subjects. It is worthy of observation, that those parts of his conduct which have been characterised as unfeeling and selfish, ha[illegible] received the approbation of posterity; and [illegible] with all the advantage we possess from the k[illegible] the effects of his measures, that they were the m[illegible]ious that could have been taken for the preservation of the peace and welfare of his country, and the establishment of the reformed religion. He was distinguished for self-command and moderation. It was observed that he never spoke li[illegible]ly of his enemies, nor embraced any opportunity of revenge; and as he was no less on his guard to avoid every undue bias from affection, it became a general remark that he was a better enemy than friend. 'I entertain,' he said, 'malice against no individual whatever; and I thank God that I never retired to rest out of charity with any man.'

In common with most other great public men, he possessed discernment in discovering men of peculiar talents for business. 'He seemed resolved that England should be distinguished above all nations for the integrity of her judges, the piety of her divines, and the sagacity of her ambassadors.' [illegible]encouraged open discussion, as tending to the discover[illegible]th. He was strictly and scrupulously impartial; magnificent in his several establishments; and liberal to his officers and dependents. He gave largely in charity, and increased his private fortune without borrowing from the coffers of the state, as before his time was the common custom with those who had the power, and without tarnishing his fame by any public or private extortion, as appeared at his death, when the queen instituted a rigorous inquiry into his affairs. In private he was cheerful, affable, and facetious: abstemious in his own diet, he enjoyed the cheerful relaxation at his table with his family and friends. 'Indeed,' says Fuller, 'no man was more pleasant and merry at meals, and he had a pretty wit-rack in himself to make the dumb to speak and to draw speech out of the most silent and sullen guest at his table, to show his disposition in any point he should propound.'

Books and the superintendence of his garden at Theobald's formed his chief amusement in his few hours of leisure. His mind was strongly tinctured with piety. His faith had been endeared to him by persecution: his piety was exalted by the sacrifice of his interests to religion; he was accustomed to say, 'I will trust no man if he be not of sound religion, for he that is false to God can never be true to man.'

In 1589 he lost his wife Mildred, his affectionate companion for 43 years. The despondency produced by this calamity, the increasing infirmities of age, and successive attacks of the gout, rendered more severe by a weakness which had been caused by his sedentary habits, interrupted the unruffled calmness of [illegible] temper: he became subject to bursts of peevishness, but on such occasions he immediately endeavoured to make reparation for the pain which he had caused. He died, says his contemporary biographer, on [illegible]th August, 1598, in the 78th year of his age, having held the station of prime minister of England for upwards of half a century. His death-bed was surrounded by friends whom he esteemed, by children for whose future welfare he had provided, by servants devoted to him from a long interchange of good offices, and he expired with the utmost serenity and composure. He had, by hi[illegible] wife, Robert, created earl of Salisbury; Anne, married to Edward Vere, seventeenth earl of Oxford; and Elizabeth, married to William, eldest son of Lord Wentworth, of whom the first-named only survived him.

(Macdiarmid's *British Statesmen*; *Biog. Brit.*; Camden's *Annals*; Fuller's *Holy State*.)

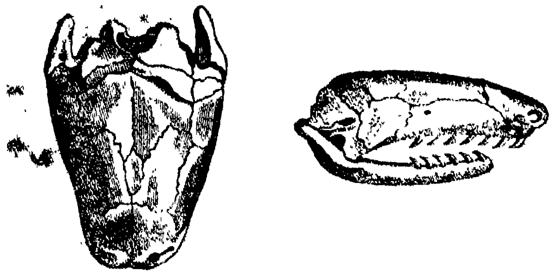
CECIL, ROBERT, EARL OF SALISBURY, son of Lord Burleigh, by his second wife Mildred, was born about 1550. He was of a weakly constitution and deformed in his person, upon which account he was not sent to school; he afterwards went to St. John's College, Cambridge. He was knighted by Queen Elizabeth, who sent him as assistant to the earl of Derby, the English ambassador in France. On his return, in 1596, he was appointed second secretary of state; and on the death of Sir Francis Walsingham became principal secretary, in which office he continued till his death. He was appointed to various offices of trust by Elizabeth; and on the decease of his father, succeeded him as prime minister. He privately corresponded with James I., and, on his accession, was confirmed in his office. In 1603, he was created baron of Essenden: in 1604, Viscount Cranbourne; and in 1605, earl of Salisbury: his elder brother Thomas being created earl of Exeter on the evening of the same day. He was also elected chancellor of the university of Cambridge, and installed a knight of the garter in the same year. In 1608, on the death of the earl of Dorset, he succeeded to the office of lord high treasurer, in which capacity he effected great reformation in the Exchequer. He was unquestionably the ablest minister of his time, and appears to have repressed the increasing encroachments of the crown to the utmost of his power. He exposed himself to considerable odium, and made many enemies as the chief promoter of the disgrace and fall of the earl of Essex, and afterwards of Sir W. Raleigh. Indeed with regard to Raleigh, subsequent inquirers have charged him with criminal and disgraceful conduct; but he was never accused of pecuniary corruption or dishonesty. He married Elizabeth, daughter of William Brooke, Lord Cobham, by whom he had a daughter and a son. Worn out with business, he died at Marlborough, on his road from Bath, where he had been for the recovery of his health, on the 24th of May, 1612, observing to Sir Walter Cope—'Ease and pleasure quake to hear of death; but my life, full of cares and miseries, desireth to be dissolved.'

He wrote 'A Treatise concerning the State and Dignity of a Secretary of State, with the Care and Peril thereof;' 'A Treatise against the Papists;' and 'Notes on Sir John Dee's Discourse about the Reformation of the Calendar.' (*Biog. Brit.*; Peck's *Desiderata Curiosa*.)

CECILIANS (Zoology), the name of a genus of naked serpents (*Cécilies* of the French), which some naturalists have considered as belonging rather to the Batrachians, but which Cuvier, following Linnæus, places in his third and last family (*Les Serpents Nus*) of the Ophidians, observing that those who placed it among the Batrachians did so without knowing whether the form underwent metamorphosis or not.

This genus was named Cœcilia by Linnæus, from the supposed blindness of the species. The eyes, in fact, are exceedingly small, and nearly hidden under the skin. Cuvier observes that in some species these organs are wanting altogether, and the following is his description of the genus. The skin is smooth, viscous, and striated with annular folds. It would appear altogether naked, but on dissection scales well formed are found in its thickness: but these scales are delicate and disposed regularly in many transverse rows between the wrinkles of the skin, as Cuvier himself saw with certainty in *Cæcilia glutinosa*, *Cœcilia albiventris*, and other species. The head is depressed. The vent is round, and very near the end of the body. The ribs are too short to circumvent the trunk, and the articulation of the bodies of the vertebræ is effected by facets with hollow cones, the depression in which is filled with a gelatinous cartilage, as in the fishes and in some of the Batrachians. Their skull is united to the first vertebra by two tubercles, as in the Batrachians; a mode of union approached by the

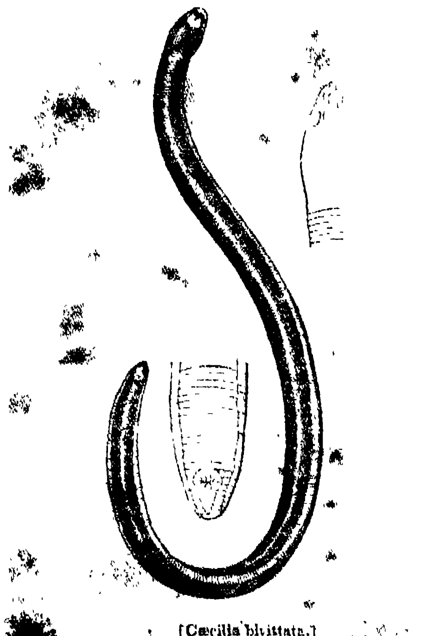
Amphisbænæ only among serpents. Their maxillary bones cover the orbit, which is only pierced in the form of a small hole, and the temporal bones cover the temporal fossa, so that the head when examined from above presents only a continuous bony shield. Their os hyoides, composed of three pair of arches, may have [illegible] the supposition that in early youth the bones support[illegible]. The maxillary and palatal teeth are arranged on two concentric lines, as in the Protei, but are often sharp and curved backwards as in the true serpents. The opening of the nostrils is at the back of the palate, and the lower jaw has no moveable pedicle, while the tympanic bone is dovetailed (*enchassé*) with the other bones into the shield of the skull. The only *ossiculum auditûs*, or auditory bone, is a small plate upon the *fenestra ovalis*, as is the case with the salamanders.



[Skull of Cæcilia.]

The auricle of the heart in these animals is not divided sufficiently deep to be regarded as double, but the second lung is as small as it usually is in the other serpents. The liver is divided into a great number of transverse leaves (*feuillets*). In their intestines Cuvier states that there is to be found a quantity of vegetable matters, vegetable earth (*humus*), and sand.

Geographical distribution.—Warm climates. *Cæcilia annulata*, for example, is an inhabitant of Brazil (Spix), and *Cæcilia glutinosa* of Ceylon. Daudin indeed says that the last named species is American: but Cuvier avers, notwithstanding Daudin's assertion, that M. Lechenault brought it to France from Ceylon. He adds, however that *Cæcilia bivitata* (*bivittata*), Cuv., a species nearly approaching *C. glutinosa*, is an inhabitant of America.



[Cæcilia bivittata.]

In treating of *Cæcilia*, Dr. Mayer expresses his dissent from all naturalists who have hitherto written on the genus, with respect to what have been considered its most essential characters. The wrinkles on the skin, for instance, which have been so much insis[illegible] be in themselves very unimportant, [illegible] mainly due to the contraction of the ski[illegible] spirit in which the animals are preserved. [illegible] by some as being entirely devoid of [illegible] Mayer enters into a very minute account of [illegible] ma[illegible] which its outer covering is formed, which clearly proves that this also is a mistaken notion (*Zoological Journal*, vol. iii, p. 254).

The *Cecilians*, in the system of W[illegible] form the sixth order, and comprehend only thre[illegible] ra, *Siphonops* (Wagler), *Cæcilia* (Linnæus), and [illegible] (Wagler), and are referred to a family termed *Hedro*[illegible] because the tongue adheres throughout its length to [illegible] lower jaw. The following are the characters of this family [illegible] y without a tail, naked; os carré (*tympani*) soldered to the skull; two occipital condyles; orifice of the [illegible] rounded, and situated at the extremity of the body.

CECROPS. [ATHENS, p. 14.]

CECROPS (Zoology). [PÆCILOPOD[illegible]

CEDAR. [ABIES. JUNIPERUS.]

CEDRE'NUS. [BYZANTINE HISTO[illegible] p. 82.]

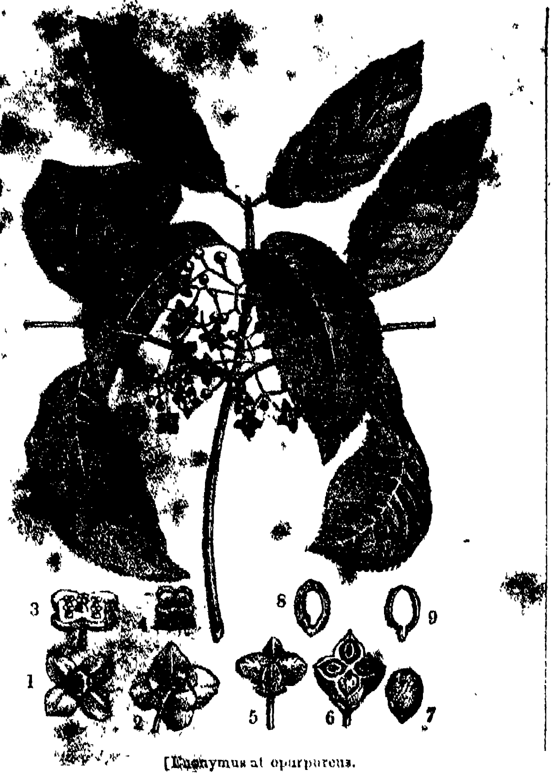
CELANDINE. [CHELIDONIUM.]

CELA'NO, a beautiful lake (the Fucinus [illegible]) and also a town in the province of Abruzzo Ultra, or the further Abruzzo, in the kingdom of Naples, in Italy. The [illegible] and the tunnel made by the Emperor Claudius to [illegible] off the superabundant water of the lake, which is liable to great and sudden rises, are described under the general head of Abruzzo. Since that article was written, the antient tunnel, which had been blocked up and altogether useless for many centuries, has been so far rendered available as to carry off a constant though not a large stream of water through [illegible] mountain into the Liris, or Garigliano, which runs in a deep and narrow valley at the distance of three miles from the lake.

It is supposed that this issue of water will suffice to keep the lake to its present level; but much greater plans are proposed—namely, to enlarge and extend the tunnel, to correct some hydraulic errors committed by the Romans, and make the subterraneous passage serve to reduce the lake to the limits which it occupied in 1745, since which year its encroachments have swallowed up more than 10,000 acres of the best land in the province. The important repairs already [illegible]d have been made at the expense of the king of Naples under the direction of Signors Afan de Rivera and Luigi Giura. Considered merely as a remnant of [illegible]uity, the tunnel, or, as it is called in the country, the emis-[illegible] (*emissario*) of Claudius, is an exceedingly interesting object. At the opening of it near the lake, it is about thirty feet high and twenty-eight feet broad; but it appears that it contracts considerably as it advances through the mountain. Its whole length is three miles. It is in part cut through a solid calcareous rock, and in part through a chalky earth that has little tenacity. Wherever the latte[illegible] stance occurs it is supported by masonry of admirable [illegible]manship. To admit light and air the Romans sunk shafts from above, through the body of the mountain, down to the level of the passage. The entrance to this tunnel is about a mile and a half to the south of the town of Avezzano.

The town of Celano, a thriving place, with a populati[illegible] about 3000 souls, is beautifully situated on a hill, about a mile and a half from the northern shore of the lake. The name occurs very frequently in the history of the middle ages, when the counts of Celano were among the most powerful feudal lords in Southern Italy. Besides Avezzano, which is equal or rather superior in importance to Celano, there are Luco, Trasacco, Ortucchio, and many other small towns and villages scattered round the shores of the lake, or on the sides of the mountains above them.

CELASTRA'CEÆ, a natural order of polypetalous exogens, consisting of [illegible] trees principally found in temperate latitudes, a[illegible] abounding in either the colder or the hotter parts of the world. They have simple alternate or opposite leaves, a small number of perigynous stamens inserted into a fleshy disk, and alternate with the petals, a superior syncarpous ovary immersed in the fleshy disk, and a superior capsula[illegible]culent fruit, with a small number of ascending seed[illegible] order is not of much œconomical importance. A [illegible] degree of acridity is said to have been detected in some of the species. Euon[illegible], or the spindle tree, the wood of [illegible] is used for [illegible] skewers, is the commonest Euro[illegible] form of th[illegible] [illegible].



[Euonymus atropurpureus.

1. A front view of the flower. 2. The same from below, showing the calyx. 3. A view of the disk, with the stamen [illegible] t. 4. A stam[illegible] 5. A ripe fruit. 6. A cross section of the s[illegible] d. 8, 9. Sect[illegible] f the latter.

CELEBES, a large island of singular shape in the Eastern Seas, lying between 2° N. lat. and 6° S. lat., and extending from 119° to 125° E. long. The extreme length of the island from N. to S. is near 500 miles. The coast on the S. and E. is so deeply indented by three bays as to give to the whole island the appearance of four large peninsulas. The area of Celebes is perhaps about 70,000 square miles, but there is a very considerable discrepancy in estimates that have been made.

This island is separated from Borneo by the Strait of Macassar, the eastern boundary of which is formed by the western coast of Celebes. This strait, which is 300 miles long from N. to S., is about 120 miles broad, except at its northern termination, where it is contracted to half that breadth by Konneeoorgan Point on the eastern coast of Borneo. The three bays or gulfs of Celebes are Sewa or Buggess Bay, Tolo Bay, and Tomini or Gorong-talu Bay. Sewa Bay, sometimes also called the Bay of Boni, is entered from the S.; Tolo Bay is open to the S. and the E.; and Tomini Bay, which is towards the northern part of the island, is entered from the E. The gulf, which is formed by the northern division or limb of Celebes, by the north-eastern coast of Borneo, by the Soo-loo Archipelago, and the island of Mindanao, is called the Sea of Celebes.

The island is divided into several small independent states, of which Count Hogendorp has described thirteen. 1. The districts of Menado and Gorontalo are in the northern part of the island. The first belongs in full sovereignty to the Dutch government, and the second is under the nominal sway of a sultan who is in a state of vassalage to the Dutch. These districts produce coffee, rice, and gold; and excellent cordage is made from the fibrous product of a tree, the *Goumouti*. 2nd. Mandhar is [illegible] among seven chiefs, between whom an intimate alliance is kept up. 3rd. The territory of the p[illegible] of Siderseng. 4th. The kingdom of Tanete, on the west side of the island. 5th. The states of Luwu, Wadjo, and Soping, to the north of the gulf of Boni; the first, on the east side of the island, is one of the greatest sovereignties, and occupies nearly a fourth part of the territory of Celebes. [illegible] internal condition of this kingdom is but little known, and no statements have been offered concerning its population. Wadjo and Soping together contain about [illegible] souls. 6th. The kingdom of Boni is populous but poor. An efficient report, made in 1824 by the Dutch residents, stated that the king of Boni had within his dominions 40,000 men capable of bearing arms, and that the whole population amounted to 200,000. 7th. The dominions of the king of Macassar, having a population of [illegible]5,000 souls. 8th. Tello, governed by a queen, a vassal [illegible] king of Boni. 9th. The districts of Maros, with a population of 100,000 souls, divided into regencies under the Dutch government. 10th. The states of Touraite, divided among three chiefs who were formerly vassals of Boni, but who made themselves independent of that power in 1814, and placed themselves under the protection of the Europeans in the island. 11th. The districts of Boulicomba and Bonthain, with 25,000 souls, under the Dutch government. 12. Districts, also under the Dutch, denominated the Southern Districts, divided into twelve regencies, and containing a population of 75,000. And 13th, the small district in which Fort Rotterdam, the chief seat of the Dutch government, is situated: the population of this district is about 15,000 souls.

The native sovereignties here mentioned are all subdivided under numerous feudatory chiefs.

The centre of the island, the nucleus of the four peninsulas, is a mountainous tract from which four arms branch out into the four peninsulas respectively, and terminate in promontories.

The island contains three considerable rivers. The largest, the Chiurana, rises in the Wadjo country, crosses the kingdom of Boni, and discharges itself by several mouths into the gulf of Sewa. This river is navigable to a considerable distance by ships of 300 or 400 tons burthen; the native proas ascend much farther to a fresh-water lake. The river Boli has a bar at its mouth with three fathoms water: it discharges itself on the north coast after a long and winding course. The third river has its mouth on the west coast to the south of Macassar. Besides these rivers, there are numerous small streams, especially on the south coast, which are navigable for a few miles by the vessels of the country.

The island is for the most part fertile, but agriculture is generally in a very backward condition, the inhabitants being much attached to antient customs and superstitions, and their tastes leading them to prefer navigation, fishing, and commercial pursuits to the more quiet employments of farming. The Bugis, or inhabitants of Boni, are excellent seamen: their proas visit every part of the Indian archipelago, and even go as far as the Gulf of Carpentaria for the purpose of taking the tripang (biche de mer), which is a profitable article of trade with China. These proas, which the natives call *paduakans*, are never larger than 50 tons burthen. Their bows are lowered or cut down so as to be often under water, while a high bulk-head is raised at the stern to keep off the sea. They have [illegible] a tripod mast, made of three stout bamboos, two rising from the sides and one from the bow, and lashed together at the top; this mast carries a high pointed sail.

The principal productions of the island are rice, maize, and cassava, but not raised in sufficient quantity for the consumption of the inhabitants, and every year rice is imported from Java. Cotton and tobacco are raised in small quantities. In the district of Luwu are iron mines, yielding metal of an excellent quality. The island also contains gold mines, which have never been regularly wrought. The whole coast abounds with fish, and the number of turtle taken is so considerable that 50,000 pounds weight of tortoise-shell is annually shipped. The women of the country weave cotton cloths of common quality for domestic use, and of a finer kind, which are exported to Java and other of the Indian islands.

The Macassar horses are larger, stronger, and of higher courage than those of Java, to which island many hundreds of them are annually taken for sale.

The population of Celebes is composed of several distinct races, speaking different languages. The Bugis are the most numerous, and include a large proportion of the tribes in the southern parts of the island. The Macassar language is [illegible] by several tribes who inhabit the south-western limb. [illegible] Mandharese language prevails in the central part of [illegible]and, and towards the western coast, and the Manados inhabit the north-eastern limb. The centre of the island towards the north is inhabited by Turajas or Horaforas, who are supposed to be the aborigines of Celebes. Of all these people the Bugis are considered to be the first in enterprise and intelligence; they engross nearly all the carrying trade of the Indian archipelago, the trading of other tribes being almost entirely confined to coasting voyages. The Bugis are esteemed to be very fair dealers, and they often embark in extensive speculations. The Portuguese formed a settlement at Macassar in the year 1[illegible], and it was not until after that time that the Mohammedan religion was introduced; it is not known in what their religious faith or ceremonies then consisted. In 1603, the rajah of Macassar, with the whole of his subjects, made a public renunciation of their antient faith, and embraced Mohammedanism, after which they immediately compelled their weaker neighbours to follow their example.

It appears from the early records of the English East India Company, that they must have established a factory at Macassar about the beginning of the 17th century, which was broken up through the contrivances of the Dutch, who in 1667 concluded with the rajah a treaty, afterwards known as the Boni treaty, by one article of which he engaged to expel both the Portuguese and English, and not to admit the subjects of any other European nation, or ambassadors from such, to enter his dominions.

The principal establishment of the Dutch in Celebes is at Macassar, on the west coast, and near the southern extremity of the island, on the spot where formerly stood the native town of Macassar, known also under the name of *Oudjong Pandang*. The European inhabitants at present amount to about 800 souls, exclusive of the garrison stationed in Fort Rotterdam. The roadstead affords good and safe anchorage, being protected from the N. to the S.W by two islands called Great and Little Ly-Ly. The Dutch governor of Macassar has under his orders five resident who are severally stationed in the North, the South, and the Bontain districts, the island of Sumbhawa, and the island of Salayr, for the purpose of administering justice. In 1811 the Dutch authority in Celebes was transferred by conquest to the English, who, on the return of peace, quitted the island, in which the Dutch again established themselves in 1816.

(Stavorinus's *Voyages*; Forrest's *Voyage*; Crawfurd's *Indian Archipelago*; Count Hogendorp's *Coup d'Œil sur l'Ile de Java, &c.*; *Report of Committee of House of Lords on the Affairs of India*, 1830.)

CELERY, or **APIUM GRA'VEOLENS**, is a wild umbelliferous plant by no means uncommon in the marshes of England, especially near the sea in the isle of Thanet it is abundant. In its native station it has the character of being a poisonous plant, but transplanted to a garden, it becomes an agreeable and wholesome vegetable. This is in conformity with the general properties of umbelliferous plants, in which two principles, the aromatic and the narcotic, exist, and which are food or poison, as the one or the other predominates. The narcotic is generated abundantly in moist places, and the aromatic principally in dry situations; and hence plants that are dangerous while growing in marshes become wholesome when transferred to dry places. This appears to be one cause of the difference between the wild and the cultivated celery; another is that the latter is blanched before it is brought to table, and thus the secretion of its deleterious principles is prevented.

Of garden celery there are many varieties, the best of which for salad is the Turkish, and for stewing, the Celeriac or the turnip-rooted sort. For soups, the 'seeds' may be employed with as much advantage as the stems or leaves.

Celery is raised in beds, from seed sown from the end of March to the beginning of May, and requires a light, rich, well-drained soil. When the plants in the seed-bed are about two or three inches high, they are pricked out into another bed, where they remain till they are six or seven inches high; they are then transferred to trenches, in which they are placed in a row, and finally left. As they advance in size, they are gradually and carefully earthed up, till at last the whole length of the stem under ground is sometimes as much as four feet. The goodness of celery depends essentially upon its growing rapidly, being kept well drained from moisture, and having a solid stalk to its leaves. Celeriac is not earthed up, but is grown upon the surface of the ground, and kept free from weeds and preserved from the emission of strong lateral roots by frequent hoeing. (See *Horticultural Transactions*, vol. iii.)

CELESTINE, or **CŒLESTINUS I.**, bishop of Rome, succeeded Boniface I. in 422, was engaged in disputes first with the African bishops on matters of discipline and ecclesiastical jurisdiction, afterwards [illegible]gians in Britain, and lastly with the Nestorians [illegible] the instigation of Cyril, bishop of Alexandria, a [illegible] anti-Nestorian. Cœlestinus died in 431, and was succeeded by Sixtus III.

CELESTINE II., a Tuscan, succeeded Innocent II. in 1143, and died after a five months' pontificate in 1144.

CELESTINE III. succeeded Clement III. in 1191, crowned the emperor Henry VI., excommunicated Leopold, duke of Austria, and Alonso IX., king of Leon, and died in 1198.

CELESTINE IV., a Milanese, was elected to succeed Gregory IX. in 1241, but died a few days after his election.

CELESTINE V., Pietro da Murrone, was elected in 1294; a few months after he resigned his office, and was succeeded by Boniface VIII., who confined him in the castle of Fumone, where he died, it is said, of starvation. [Boniface VIII.]

CELESTINES, ORDER OF, a monastic order, instituted about 1254 by Pietro da Morrone, afterwards Pope Celestine V., from whom they took the name of Celestines. Their first convent was at Murrone, in the Apennines of Abruzzo. It was a reform of the order of St. Bernard. Urban IV. approved its institution, and Gregory X. granted many privileges, with an exemption from payment of tithes, &c. It became a very rich order, both in Italy and France. In 1770, in consequence of an order from Louis XV., the Celestines of France held a capitulum, or general assembly, from the various houses they had in that country, to consider of several reforms in their discipline and economy, which were insisted upon by the king. These however they refused to adopt, and preferred the secularization or suppression of their order, which was ultimately effected by Pius VI. in 1776-8. Their property was taken possession of by royal commissioners, a suitable pension being allowed to each monk. Some years after, Ferdinand IV. of Naples suppressed the Celestine convents in his kingdom. [Buonafede.]

CELLA. [Temple.]

CELLARIA. [Cellariæa.]

CELLARIÆA, or **CELLARIADÆ** (Zoology), the second family, according to De Blainville's arrangement, here given, of the sub-class *Polypiaria Membranacea*.

Animals hydriform, provided with very delicate tentacula, separated, distinct, contained in oval flattened membranous cellules, with a bilateral nonterminal opening forming by their lateral junction, on one or two tiers or stages, a sort of cretaceous or membranous, limited, diversiform and fixed polyparium.

Ovaries external?

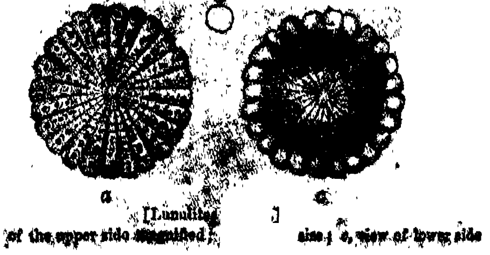
The *Cellariæa* (Polypiaria membranacea cellariæa), for such is De Blainville's term for the family, are, as he observes, sufficiently defined, inasmuch as the cellules, which are more or less polygonal, with a binary opening, are always disposed in laminæ or plates, applied either to foreign bodies, or against another similar plate, or around a supposed axis, as in the last genera of the family (*Polypiaria operculifera*) which precedes it, but they are not provided with an operculum. De Blainville remarks on the possibility of a division of the so-called multilocular shells belonging to this family, and being composed in fact of young [illegible].

GENERA.

I. *Lunulites* (fossil).

Animals unknown, contained in cellules with a superior opening, disposed upon a single tier or stage in concentric circles and diverging rays, so as to form a cretaceous, sufficiently regular, orbicular polyparium, convex above, concave below, and marked with depressed striæ radiating from the centre to the circumference.

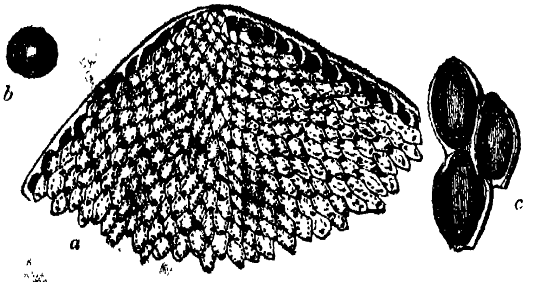
Example. *Lunulites radiata*. Locality, Grignon, &c.



[Lunulites [illegible].]

[illegible] of the upper side magnified; [illegible] size; c, view of lower side

Lamarck established this genus for two small fossil polyparia. Lamouroux considered the second species (*Lunulites urceolata*) sufficiently different to warrant his establishing on it a distinct genus, named by him *Cupularia*. *Lunulites cretacea* occurs in the cretaceous group at Maestricht, Tours, and in the baculite limestone of Normandy. The following cut of Defrance's *Lunulite en parasol* illustrates the juxtaposition and form of the cellules.



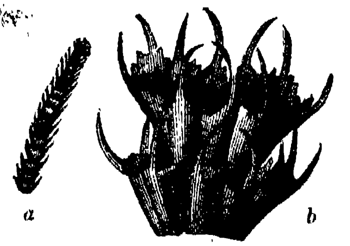
[Defrance's Lunulite en parasol.]

a, a portion magnified; *b*, natural size; *c*, three cells highly magnified.

2. *Electra.*

Animals unknown, contained in membranous, vertical, bell-shaped cellules, ciliated on the edges and shut by a diaphragmatic membrane, with a very small and semilunar opening, and verticillated either round some foreign body or under the form of spiciform branches.

Example. *Electra verticillata.*



[Electra verticillata.]

a, natural size; *b*, magnified.

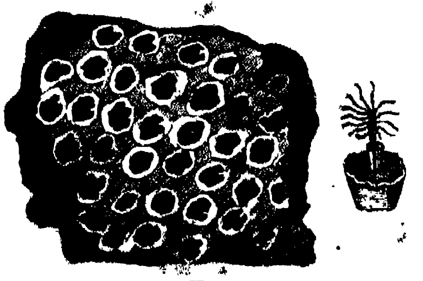
This is the *Flustra verticillata* of Gmelin, *Sertularia verticillata* of Esper; and the genus, which was separated by Lamouroux, does not differ from the other Flustræ except in the verticillated disposition of its cellules round the bodies which those cellules incrust, and, as De Blainville observes, scarcely deserves to be distinguished from *Flustra pilosa*, whose cellules are occasionally somewhat verticillated.

3. *Flustra.*

Animals hydriform, provided with simple tantacula, contained in complete, distinct, very flat cells, formed by a thick border encircling a membranous part, in which the subterminal and transverse opening is pierced, disposed regularly and in the form of a quincunx, so as to produce a membranous flexible crust or polyparium, fixed by radical fibrils.

α. Encrusting species.

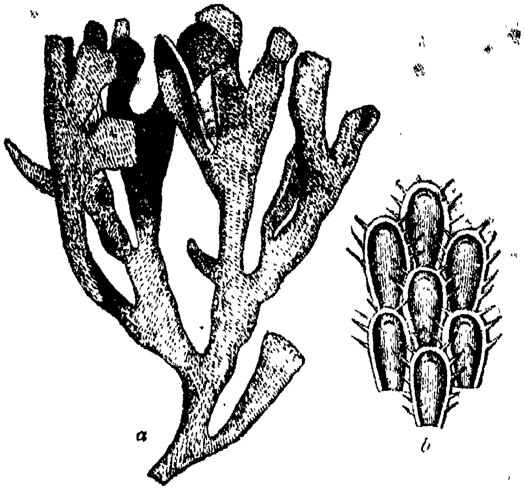
Example. *Flustra dentata.* Locality, Northern Seas.



[Flustra dentata magnified.]

β. Frondescent species with two tiers or stages of cells.

Example. *Flustra foliacea.*

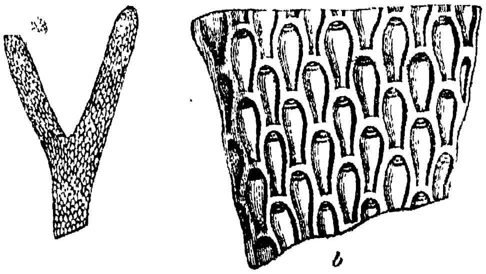


[Flustra foliacea.]

a, natural size; *b*, some of the cells magnified.

γ. Frondescent species, with a single tier of cells.

Example. *Flustra carbasea.* Locality, Seas of Scotland, &c.



[Flustra carbasea.]

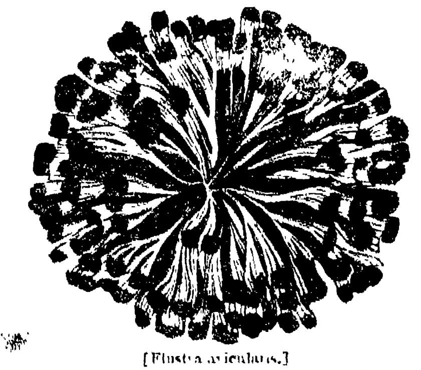
a, a portion, natural size; *b*, a portion magnified.

Mr. Dalyell, in his interesting paper entitled 'Further Illustrations of the Propagation of Scottish Zoophytes' (*Edinburgh New Philosophical Journal*, April-July, 1836), gives the following account of the propagation of the *Flustræ*. Speaking of *alcyonium*, he says, 'We find it consist of a compact gelatinous or fleshy matter, studded with innumerable cells sunk in its substance, which are inhabited by vivacious hydræ. Different species or varieties occur in the Scottish seas, especially the *gelatinosum*, and a thin green flattened palmate kind, which has perhaps escaped the notice of naturalists hitherto. A white, opaque, ovoidal or nearly circular, flattened corpusculum, previously invisible, issues from the fleshy part of these products, whence it seems to be elicited, particularly by the influence of light. On removal of a small specimen, that had already afforded many, from a dark situation to a moderate degree of light, at least 150 quitted their recesses within an hour. These beings are endowed with much greater activity than the corpuscula of the actinia; their courses are alike diversified; they swim through the water in all directions, regularly and irregularly, ascending to the surface or descending to the bottom, pursuing a straight line, describing an orbit, or tumbling about among the neighbouring substances. Meanwhile, as if of soft consistence, their form alters, and the action of the cilia environing the body is alternately depressed and relaxed. At length, having become stationary, a margin diffuses around the body, and supervening transparence of the centre soon exposes an inanimate hydra within, which in nine or eleven days is displayed perfect from its cell. The inner surface of each tentaculum is now clothed by a double row of stout dark cilia in rapid motion, but in opposite directions; for as those of one side strike upwards, those of the other strike downwards. Further diffusion of the basis adhering below forms additional compartments for other hydræ. The propagation of the Flustræ *carbasea*, *foliacea*, and *truncata* ensues after a similar fashion. A ciliated corpusculum, spherical, ovoidal, or irregular, quits the leaf, pursues its course in the water, becomes stationary, adheres, and a nascent Flustra arises from the spot. Above ten thousand such corpuscula have been produced by a moderate-sized specimen of the *Flustra foliacea*, tingeing the bottom of a vessel yellow from their multitude, and vitiating the water by their decay.'

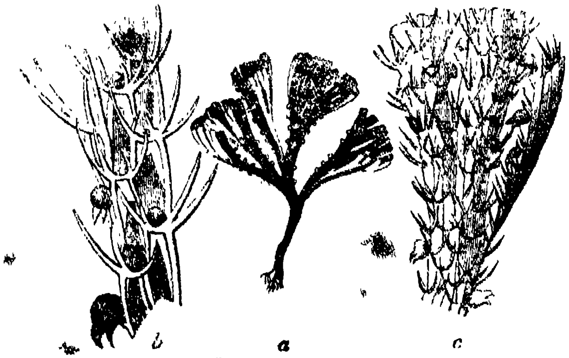
The same author, in the 'Proceedings of the British Association' (Edinburgh, September, 1834), thus clearly and elaborately describes the organization of *Flustra carbasea*. 'The *Flustra carbasea* resembles a leaf divided into subordinate parts, one of the surfaces being studded with cells, and the other exhibiting elevations or convexities corresponding to their bottom, and the whole product is of a yellowish colour. Each cell, of a shuttle or slipper shape, level with the surface of the leaf, is inhabited by a vivacious polypus, exercising a percussive faculty both of the tentacula individually and of the whole head. Some of the cells are occupied occasionally by large, bright yellow, irregularly globular, solid ciliated animalcula, subsequently quitting them to swim heavily below. In several days they become motionless like the former, and die also without immediate decomposition. Next, there appears in just about the same spot below, occupied by the motionless animalculum, a yellow nucleus with a lighter diffusing margin. This in its further diffusion assumes a shuttle or slipper form, it becomes a single cell, which afterwards displays a polypus under the wonted figure and action. The adult Flustra was *vertical*, for the leaf is always erect; but here the new cell is *horizontal*. By a singular provision of nature, as only one side of the adult is cellular, the original cell is necessarily a root, sole, or foundation, to admit subsequent enlargement, which in such zoophytes is always from a single cell. One end of the cell next rises vertically, wherein a second cell, with its polypus, is soon displayed overhanging the first, and at right angles to the plane of its position.' (See also Professor Grant's Observations on the Polypes of this species in the 'Edinburgh New Philosophical Journal.')

δ. Frondescent species, with straight lobes and a single tier of cells.

Example. *Flustra avicularis.* Locality, European Seas. Seaford Bay, Sussex.



[Flustra avicularis.]
showing a spherical mass of the natural size



[Flustra avicularis.]
a, a specimen showing the root and branching form of the natural size; *b c*, portions magnified: from Sowerby's 'British Miscellany,' London, 1806

Fossil Flustræ.

These occur in the Baculite limestone of Normandy, the chalk of Sussex, the Great Oolite (Wilts), and in the Greywacke group (Gottland, Gloucestershire, Herefordshire, and the South of Ireland). De Blainville gives the following localities

α. Encrusting species.

In the calcaire tertiaire of Grignon, of Paris, and of the Plaisantin, and in the [illegible] de [illegible] et de Boulogne.

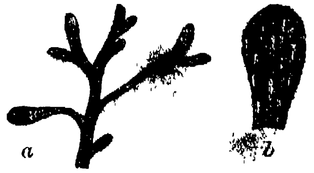
β. Frondescent species, with two tiers of cells.

In the limestone of Valognes and in the calcaire tertiaire of Grignon.

4. *Elzerina.*

Animals unknown, contained in sufficiently large oval elongated subhexagonal bordered cellules, having a membranous tympanum or drum, in which is pierced the sigmoid opening, forming by their quincunxial and circular arrangement the branches of a membranous, plant-like, nonarticulated, dichotomous, and fixed polyparium.

Example. *Elzerina Blainvillii.* Locality, the Seas of New Holland.



[Elzerina Blainvillii.]
a, natural size; *b*, a portion magnified.

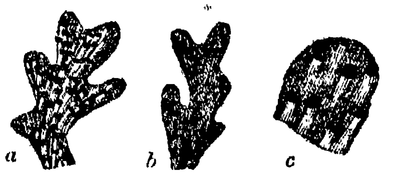
De Blainville observes that this genus was established by Lamouroux for a polypier brought from the seas of Australasia by Péron and Lesueur, which De Blainville examined in Lamouroux's collection, and that he has been satisfied that it is a genus which can hardly be distinguished from the phytoid or plant-like Flustræ—that it differs from them only in the union of the cellules, which form a circular quincunx, as in *Cellaria Salicornia*, and are still more soft and membranous.

Risso records two species of Elzerina in the Mediterranean, *E. venusta* and *E. mutabilis*; but De Blainville observes that, if it be true that their cellules are scattered, it is probable that those species do not belong to this genus.

5. *Pherusa.*

Animals unknown, contained in oval cellules, terminated by a sufficiently large projecting tubular opening, and disposed in oblique series on one of the surfaces only of a membranous or subgelatinous, lobated, frondescent, flabelliform, and fixed polyparium.

Example. *Pherusa tubulosa.*



[Pherusa tubulosa.]
a, upper side; *b*, lower side; *c*, a portion highly magnified.

This is the *Flustra tubulosa* of Ellis and Solander. De Blainville observes that Lamouroux is undoubtedly right in having withdrawn this form from the position in which Ellis and Solander had placed it, as De Blainville ascertained by the examination of a dried individual in a good state of preservation; but he thinks that *Pherusa* is intermediate between the *Flustræ* and *Cellariæ*.

6. *Vincularia* (fossil).

Animals unknown, contained in oval, subhexagonal, regular cellules, having a subterminal semilunar orifice, and applied and united longitudinally in many rows, so as to form a cretaceous brittle polyparium, in the form of a little wand.

Example. *Vincularia fragilis.* Locality of the genus at present known, the calcaire tertiaire of Westphalia.

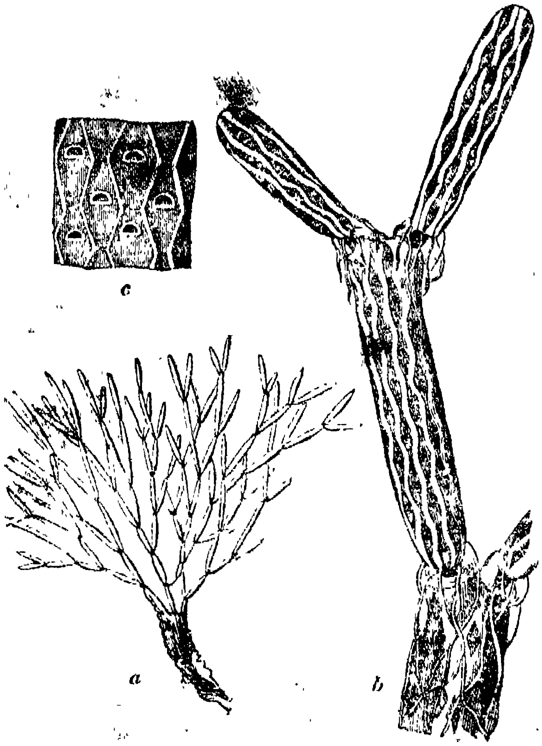
De Blainville observes that this genus was established by Defrance, and that it has been adopted by Goldfuss under the denomination of *Glauconoma*, a denomination which De Blainville rejects, remarking that Goldfuss regards it as approaching nearly to *Cellaria Salicornia*, and stating that the *Vincularia fragilis* which he (De Blainville) examined in Defrance's collection might well be nothing more than a true *Flustra*, which is found in the same beds with *V. fragilis*. De Blainville adds, in support of this opinion, that Defrance showed him a specimen which was composed of two [illegible] series instead of a single series only.

[illegible] *Cellaria.*

Animals urceiform [illegible] pitcher-shaped, furnished [illegible] a [illegible] of elongated [illegible] boscis, a circle of t[illegible]lve [illegible]cula, and an internal ovary, contained in regular hexa[illegible] or oval cells, having a transverse or subtubular opening; disposed in circular quincunx on the surface of the cylindrical dichotomous articulations of a subcalcareous phytoïd polyparium, fixed by a great number of horny radiciform tubes.

α. Species with hexagonal cellules, and with a transverse aperture. (Genus, *Salicornia* of Cuvier.)

Example. *Cellaria Salicornia*, *Cellularia Salicornia* of Pallas; *Tubularia fistulosa* of Linnæus. Locality, European seas.

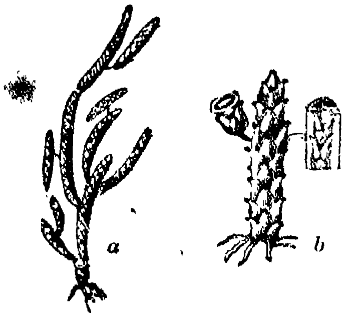


[Cellaria Salicornia.]

a, natural size; *b*, a portion magnified; *c*, a smaller portion still more highly magnified.

β. Species with oval cellules, and the aperture rounded and tubular.

Example. *Cellaria ceroïdes*, *Sertularia ceroïdes* of Gmelin. Locality, Mediterranean and the Indian seas.



[Cellaria Ceroïdes.]

a, natural size; *b*, a portion of the lower part magnified.

De Blainville observes that this genus, established by Pallas under the name of *Cellularia*, has been successively simplified by Lamarck and by Lamouroux, who has established many genera at its expense. De Blainville further states that, before Delle Chiaje, no author who had described a species of a true cellaria was known; but that the Neapolitan observer had filled this gap by informing us in his Memoirs that the polypes of *Cellaria ceroïdes* bear a perfect resemblance to those of *Millepora* (*Myriapora*) *truncata*. Pallas made a curious observation relative to the rapid growth of *C. Salicornia*, for he found individuals an inch and a half long upon the eggs of Squali, which were still far from the time when the young are excluded.

De Blainville, who studied the two living species of the seas of France, *C. Salicornia* and *C. ceroïdes*, but in the dried state, as he acknowledges, expresses his surprise that Linnæus should have bestowed the name of *Tubularia fistulosa* on *Cellaria Salicornia*, when there is nothing fistulous in its structure; and he adds, that it was probably that denomination which induced Schweigger to regard *Dactylopora* as an articulation of *Cellaria*.

De Blainville further states that no author makes mention of fossil *Cellariæ*, unless we adopt the opinion of Schweigger, who pretends that the Dactylopores and the Ovulites are nothing but articulations of *Cellaria*, an opinion which appears to De Blainville to be inadmissible.

8. *Intricaria* (fossil).

Animals unknown, contained in hexagonal elongated cellules with elevated borders, and covering the entire surface of a calcareous polyparium sufficiently solid, rush like (joncacé) internally, composed of a considerable number of cylindrical branches irregularly anastomosed.

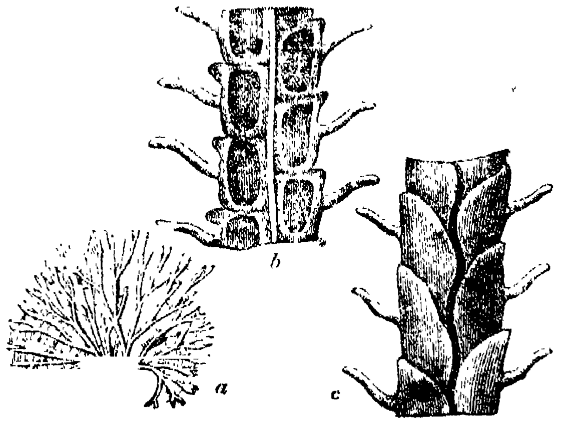
Example. *Intricaria Bajocensis*.

De Blainville observes that this genus was established by Defrance for a pretty fossil polypier found by M. de Gerville in the department of La Manche; and he states that on examining it in the collection of the first named of those naturalists, he was satisfied that it approaches very nearly to the Cellariæ, and especially to *C. Salicornia* in the form of its cellules, while, however, it differs from it because it is not articulated, and because in all probability it did not adhere by radical fibrils. Lamouroux, he adds, thought it was a millepore.

9. *Canda*.

Animals unknown, contained in cellules which do not project but are resistant, subcretaceous, disposed on two alternate rows, and upon one surface only of the dichotomous branches, articulated, joined by transverse fibrils, and forming altogether a flabelliform, radiculated, frondescent polyparium.

Example. *Canda arachnoïdea*, Lamouroux; *Cellaria filifera*, Lamarck. Locality, sea of New Holland.



[Canda Arachnoïdea.]

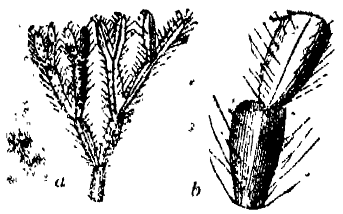
a, natural size; *b c*, portions magnified.

De Blainville observes that this genus was established by Lamouroux for a species of *Cellaria* brought by Peron and Lesueur from the Australian seas, and which he saw in Lamouroux's collection, which now forms part of the Museum of Caen. The assemblage of cells resemble the vertebral column of a fish. Upon one of the surfaces are two rows of alternate cells, separated by an angular crest. Upon the other surface may be seen the back of the cells, with tubular filaments which reach transversely from one branch to another, and are analogous to the radiciform or root like tubes. He adds that it would appear that these transverse fibrils are sometimes wanting, as in the variety noted by Lamarck.

10. *Caberea.*

Animals unknown, contained in very small cellules, disposed in quincunx on one of the surfaces only of the articulations (as if pinnated) of a calcareous, phytoïd, dichotomous polyparium, bearing on its dorsal surface the continuation of the fistulous radicles by the aid of which it is fixed.

Example. *Caberea dichotoma.*



[Caberea Dichotoma.]
a, natural size; b, two cellules magnified.

De Blainville states that he has examined the polypier on which Lamouroux established this genus, and observes that it is remarkable for the manner in which the cellules are piled obliquely on one surface only of the polyparium which they form, and on account of their being sustained by a fasciculus or bundle of radiciform tubes which occupy the dorsal surface. He adds, that the description and figure given by Lamouroux are inexact, the ridge which he represents and describes being nothing more than a disposition of the radiciform tubes; and that the pinnated *Caberea* of Lamouroux's collection is entirely different from *Caberea* dichotoma.

11. *Tricellaria.*

Animals hydriform, contained in cellules with an oval, terminal aperture with sessile borders, and disposed in three ranks, composing the articulations of a polyparium which is phytoïd, dichotomous, and fixed by radicular filaments.

Example. *Tricellaria tricythura.* Locality, seas of New Holland.

This is the *Crisia tricythura* of Lamouroux. The genus was established by Dr. Fleming, in his work on the British animals, from a species which differs from the *Crisiæ* of Lamouroux in the disposition of the cells.

12. *Acamarchis.*

Animals unknown, contained in united close-set and horny cellules, with a vesicle at the aperture, disposed in two lateral alternate ranks, and forming the articulations of a horny, phytoïd, dichotomous polyparium fixed by radiciform fibrils.

Example. *Acamarchis Neritina.* Locality, Mediterranean.

This genus was established by Lamouroux, but was not adopted by Lamarck, nor by Dr. Fleming, who, according to De Blainville, confounds it with *Bicellaria.* De Blainville states, however, that he has not examined either of the two species which constitute the genus *Acamarchis*, but remarks that it seems to him to differ too little from the true *Cellariæ* to justify a separation.

13. *Bicellaria.*

Animals hydriform, furnished with eight simple tentacula, and contained in cellules which project but little or not at all, disposed upon two alternate ranks, and opening upon the same surface of the articulations of a cretaceous, phytoïd, dichotomous polyparium, which is fixed by radiciform filaments.

Example. *Bicellaria ciliata, Sertularia pilosa.* Locality, European seas.

This division of *Cellariadæ, Crisiæ* of Lamouroux, *Cellariæ* of Lamarck, was separated by Dr. Fleming, who gave it the denomination of *Cellularia*, a name preoccupied, as we have seen, by Pallas for the whole family. Instead of this name De Blainville proposes that here given, and observes that Savigny, in the plate which he has devoted to *Cellariæ* in his great work on Egypt, has figured the solid part of four species, which, being composed of two ranks of cellules, should belong to this section.

14. *Crisia.*

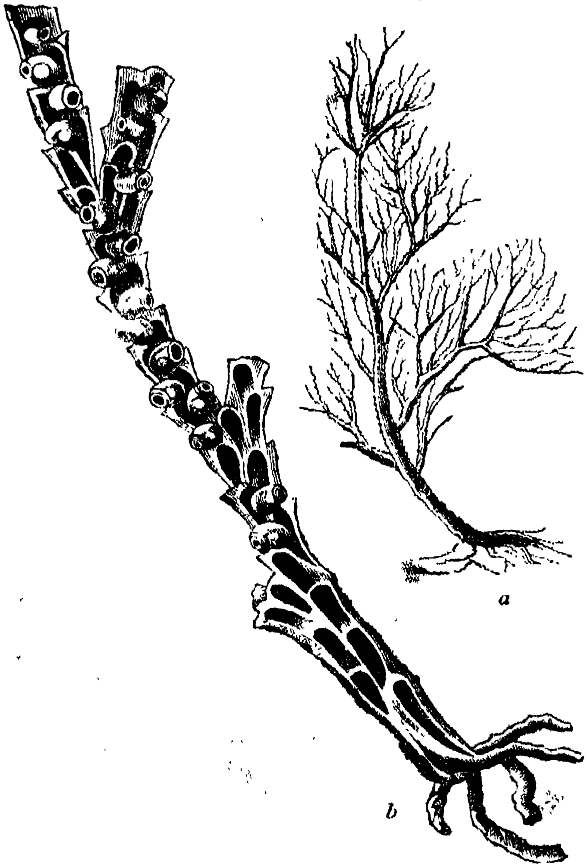
Animals hydriform, but, as to the rest of their form, unknown, contained in cellules terminated by a projecting tubular aperture, and disposed upon two alternate ranks of the articulations of a phytoïd, dichotomous polyparium fixed by radicular fibrils.

Example. *Crisia eburnea, Sertularia eburnea,* Linnæus; *Cellularia eburnea,* Pallas. Locality, European seas.

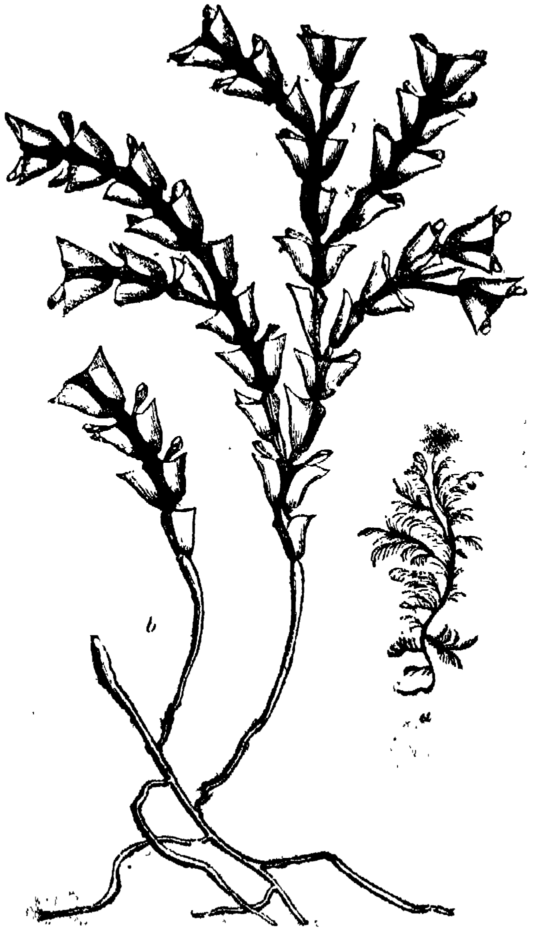
A genus established by Lamouroux, but considerably restricted by Dr. Fleming, who separated from it the species arranged under the genera *Tricellaria* and *Bicellaria.* De Blainville observes, that in a rigorous system of rational nomenclature it might be named *Tubicellaria.*

15. *Gemicellaria.*

Animals hydriform, contained in oval cellules, with an



[Acamarchis Neritina.] a, natural size; b, lower portion magnified.



[Gemicellaria bursaria.] a, natural size; b, a portion magnified.

oblique aperture, united two to two by the back, and forming thus the articulations of a phytoïd dichotomous polyparium, adhering by radiciform fibrils.

Example. *Gemicellaria bursaria.* Locality, European seas.

This is the *Sertularia bursaria* of Linnæus, *Cellularia bursaria* of Pallas, *Dynamena bursaria* of Lamouroux, and *Notamia bursaria* of Fleming.

The genus was proposed by Savigny in the plates of his great work on Egypt, under the name of *Gemellaria.* Lamouroux established it with the denomination of *Loricaria*, an appellation changed by Dr. Fleming to that of *Notamia*, because *Loricaria* had already been appropriated to a genus of fishes. Dr. Fleming's name must however give way to Savigny's on the ground of priority.

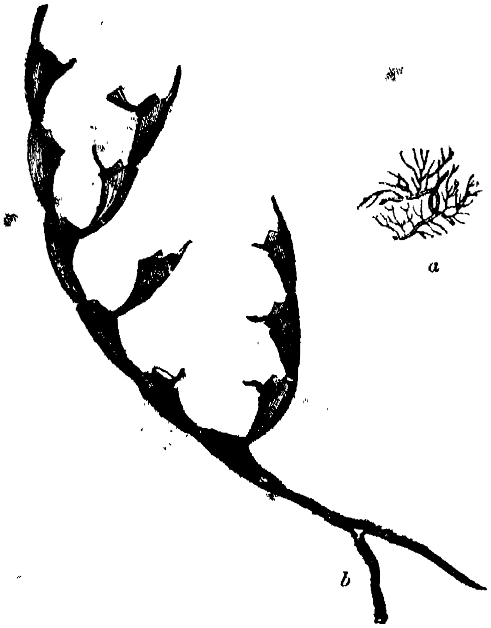
De Blainville observes that it is in truth a genus which passes so nearly into the *Sertulariæ* that it scarcely deserves to be retained.

16. *Unicellaria.*

Animals unknown, contained in long cellules with a terminal aperture, forming one to one the articulations of a calcareous phytoïd polyparium, fixed by radicular fibrils.

a. Species with the cellules a little bent. (Genus, *Eucratea* of Lamouroux.)

Example. *Unicellaria chelata*, Ellis. *Sertularia loricata*, *Cellularia chelata*, Pallas. *Eucratea chelata*, Lamouroux; *Eucratea loricata*, Fleming. Locality, European seas.



[Unicellaria chelata.]

tural size; *b*, a portion highly magnified.

β. Species with cellules elongated into a cornet shape. (Genus, *Lafoea* of Lamouroux.)

Example. *Unicellaria Lafoyi*, Lamouroux. Locality, seas of North America.

Lamouroux broke up this generic division into the genera *Eucratea* and *Lafoea.* De Blainville says that *Unicellaria* is easily characterized by the solitary disposition of its cellules, and that he had examined both *Eucratea* and *Lafoea* in Lamouroux's collection at Caen, and found the differences of too little value to warrant the separation. Lamarck, he adds, did not admit this genus, which Dr. Fleming does.

7. *Catenaria*, Savigny; *Catenicella*, De Blainville.

Animals unknown, contained in horny oval cellules, with an orifice not terminal but margined, springing one from the other, end to end, or transversely, and forming a sort of net-work or chain applied or adhering to the surface of marine bodies.

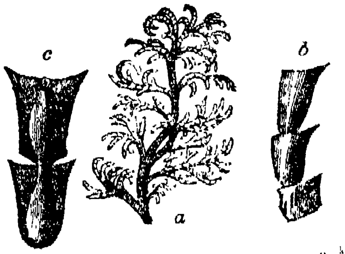
Example. *Catenaria Savignyi.*

De Blainville observes, that he found this genus indicated by Savigny in the zoological plates of the great French work on Egypt, under the name of *Catenaria*, a name which, as he says, he has modified into *Catenicella*; but he gives no reason for this, and we see no occasion for altering the name given by the admirable observer who first pointed out the generic form. De Blainville wrote the character above given from an individual which he had found on marine productions from the Mediterranean, and observes, that it is evidently a genus very nearly approaching to *Unicellaria*, from which it differs only in the cellules adhering to the bodies to which they are applied, and in their not having a terminal aperture, adding, that it corresponds exactly with the genus named *Hippothoë* by Lamouroux.

18. *Menipæa.*

Animals unknown, contained in oval cellules having a non-terminal aperture, disposed on one side only on a single rank, and rising dichotomously one from the other so as to form the articulations and branches of a subcalcareous, phytoïd, palmated polyparium, fixed by a great number of radicular fibrils.

Example. *Menipæa hyalæa*, Lamouroux. Locality, Indian seas.



[Menipæa hyalæa.]

a, natural size, *b*, *c*, cellules magnified.

This is one of the genera separated from the *Cellariæ* by Lamouroux. Lamarck did not adopt it; but, as De Blainville observes, the form and disposition of the cellules are strongly defined. He considers it as approaching the *Catenariæ* in the form of its cells, but as differing widely from it in the manner of their forming the polyparium.

19. *Alecto* (fossil).

Animals unknown, contained in elongated tubular cellules, springing one from the other, often dichotomously, with an oval, subterminal, slightly projecting aperture. The cellules are always in a single rank, and form a sort of reticulation on the surface of marine bodies.

Example. *Alecto dichotoma*, Lamouroux. Locality, the upper Jurassic limestone of Caen.

A genus established by Lamouroux for a small fossil polyparium adhering and creeping as it were over fossil *terebratulæ*, and having the disposition of its cells a good deal like those of the catenariæ, which are also creepers. De Blainville observes, that the genus has also at first sight a certain number of relations to another fossil, viz. *Aulopora* of Goldfuss.

There is another and a pretty species (*Alecto ramea*, De Blainville), found by M. Huot on a belemnite, from the chalk of Meudon.

We have in this article followed the arrangement of M. de Blainville, one of the latest systematic writers (1834) on the subject; but it is more than probable that the observations now being made by M. Milne Edwards, will produce a system founded on an accurate investigation into the organization and anatomy of these animals and their congeners.

CELLA'RIUS, CRISTOPHER, born at Smalkald in 1638, studied mathematics and the Oriental languages at Jena. When thirty years of age he was made professor of philosophy and Oriental languages in the college of Weissenfels, and in 1673 was appointed rector of the college of Weimar. Frederic I., elector of Brandenburg, and first king of Prussia, having founded a new academy at Halle in Saxony, appointed Cellarius professor of history and rhetoric, an appointment which he held till 1707, when he died. The work by which he is most generally known is the 'Notitia Orbis Antiqui,' or 'Antient Geography,' first published at Jena, in a small 12mo., but considerably enlarged in subsequent editions. The best edition is that of Leipzig, 2 vols. 4to. 1731, after the author's death, with additions by Schwarz. This work, though it had a value in its day, is now almost useless. The other works of Cellarius are, 'Historia Medii

Ævi a temporibus Constantini Magni ad Constantinopolim a Turcis captam,' Jena, 1698: 'Historia Nova, *i.e.* XVI. et XVII. Sæculorum cum initio XVIII.,' edited by Struve, 1720; 'De Latinitate Mediæ et Infimæ Ætatis, seu Anti-Barbarus;' 'Curæ posteriores de Barbarismis ac Idiomatismis Sermonis Latini;' 'Orthographia Latina ex vetustis monumentis excerpta,' 8vo. 1704, reprinted at Padua, 1739; 'Dissertatio Inauguralis Sistens Processum Juris Romani antiquum,' 4to. 1698; 'Horæ Samaritanæ, sive Excerpta Pentateuchi Samaritanæ versionis, cum Latina interpretatione et annotationibus,' followed by a Samaritan Grammar, 1682; 'Epistolæ Samaritanæ Sichemitarum ad Jobum Ludolfum,' Samaritan and Latin, 1688; 'Origines et Successiones Comitum Wettinensium,' 4to. 1697. Cellarius published editions of many of the classics, and he also edited 'B. Fabri Sorani Thesaurus Eruditionis Scholasticæ,' with additions. His Academical Dissertations were published at Leipzig, 1712. His son Solomon, who was a physician, wrote 'De Originibus et Antiquitatibus Medicis,' which some have inserted among his father's works. Andreas Cellarius, a relative of the former, wrote 'Regni Poloniæ Regionumque omnium ad id pertinentium novissima Descriptio,' 12mo, Amsterdam, 1659. Balthazar Cellarius, a physician, left several medical works.

CELLASTRÆ'A. [MADRIPHYLLIÆA.]

CELLE'PORA. [OPERCULIFERA.]

CELLI'NI, BENVENU'TO, was born in Florence, in the year 1500. His father was desirous that Benvenuto should be brought up to the profession of music, but he showed so decided a preference for the art of design that it was found impossible to keep him from his favourite pursuit, and he was eventually permitted to study sculpture: his first essays were made as a chaser and gold-worker. The elder Cellini however removed his son from the person with whom he was working, and made him apply closely to music till he was 15 years of age, when, without his father's consent, Benvenuto again established himself with a goldsmith called Marcone. In consequence of being engaged in an affray he was banished from Florence, and retired for a time to Siena. He afterwards went to Rome, where he met with great encouragement in his art. He returned however to his native city, and had every prospect of professional success, when, his ardent temper leading him into a quarrel, in which he severely wounded his antagonist, he found it necessary to disguise himself as a friar, and make his escape to Rome. It appears that he still cultivated music, for Pope Clement VII. was so well pleased at hearing him play at a concert that he took him into his service, in the double capacity [illegible] artist and musician.

The talents of Benvenuto were not confined to the arts of design and music: he distinguished himself in arms, and, according to his own account, was equally able as an engineer. When the Constable Duke of Bourbon laid siege to Rome, Cellini acted as a soldier, and he says it was he who killed the duke as he attempted to scale the city walls. He also signalized himself in the defence of the castle of St. Angelo; and the Prince of Orange, Cellini declares, was killed by a ball from a cannon which he pointed. Soon after this he left Rome, and made his peace with the magistrates of Florence. He next proceeded to Mantua, and, through the interest of his friend Julio Romano, the painter, was noticed favourably by the duke; but some indiscretion obliged him hastily to quit Mantua, and he again returned to Florence, where he became intimate with Michel Angelo Buonarotti. At the pope's invitation Benvenuto again went to Rome, where he met with great encouragement, and, among other distinctions, received the appointment of engraver to the mint. In consequence however of the ill offices and calumny of one Pompeo of Milan, he lost his place, and was even arrested for refusing to give up a work he was engaged upon. A curious instance of Cellini's weakness occurs at this time, in the fact of his devoting himself to necromancy in the hope of recovering his mistress, who had withdrawn to Naples. Having quarrelled with one Benedetto, whom he wounded severely, and being denounced moreover as having killed one Tobia, of Milan, the pope issued orders to have him apprehended, and executed on the spot; but he contrived to make his escape, and succeeded in reaching Naples, where, as the promises of the necromancer had assured him, he met his mistress Angelica. He was kindly received by the viceroy, who wished to keep him in his service, but finding himself deceived by the fair Angelica, or her mother, Cellini quitted Naples and, under Cardinal Ippolito de' Medici's protection, returned to Rome and obtained the pope's pardon. In 1534 his great patron Pope Clement VII. died; but Benvenuto's well known talents had now secured him many liberal and powerful friends. He says, in his life of himself, that on his return from St. Peter's, where he went to kiss the feet of the dead pontiff, he met Pompeo, who had falsely accused him of the death of Tobia of Milan, and that a quarrel ensued, which ended in his killing his adversary; but he adds, exultingly, he was protected from any evil consequences by the interest of his patrons, the Cardinals Cornaro and Medici; and Paul III., the new pope, desiring to have him in his service, gave him his pardon, and also reinstated him in his situation of engraver to the mint. About this time he unfortunately excited the enmity of Pier' Luigi, the pope's natural son, who endeavoured to have him assassinated, but Cellini having intelligence of the design, made his escape to Florence, where the grand duke received him with every mark of kindness, and appointed him master of the mint. The pope however, anxious to have him in Rome, sent to invite him back, and Cellini again ventured to establish himself in that city; where he remained till he was recommended to try his native air as the only means of recovering from a severe illness. He returned however to the pope's service, and was appointed to carry the presents which were made by his holiness to the Emperor Charles V., on his visiting Rome. Cellini some time after this resolved to visit France, and, passing through Padua, visited Cardinal Bembo. On arriving in France he was most graciously received by Francis I., who offered to take him into his service, but being seized with illness he felt a dislike to the country, and returned to Rome by Ferrara, where he was honourably treated by the reigning duke. On arriving at Rome he was accused by his servant of having robbed the castle of St. Angelo, during the war, of immense treasures, which led to his arrest and imprisonment. He was much persecuted on this occasion by Pier'-Luigi, the pope's [illegible] who influenced his father to continue Benvenuto in prison; a resolution in which the pope was confirmed from pique at the French king's intercession in his favour. At length, with great ingenuity, and after considerable difficulties, he effected his escape, and proceeded to his kind friend, Cardinal Cornaro, who received and concealed him for some time; but his eminence being afterwards induced to deliver him up to the pope, he was committed a second time to prison, where he was treated with the greatest severity. He acquaints us, that after he had been confined some time he had a *vision*, which assured him of his speedy liberation.

At a banquet at which the pope entertained the cardinal of Ferrara, on his return from the Court of France, his eminence succeeded in procuring Cellini's pardon and enlargement, upon which he immediately finished a fine cup for the cardinal, and employed himself in other works; as a Venus and Cupid, Amphitrite and Tritons, and other performances.

He accompanied the cardinal back to Paris, where he met with a most gracious reception from the king, but being offered by the cardinal what he conceived too low a salary for his work, he left Paris abruptly, intending to make a pilgrimage to Jerusalem, and had even proceeded some way when he was overtaken by those sent in pursuit of him, and brought back to Francis I. The king settled a handsome salary upon him, and gave him an order to make various large statues for him in silver. But he had now the misfortune to offend Madame d'Estampes, the king's favourite, who did all in her power to disgust him, and to excite the king against him. With this view she encouraged Primaticcio, who was then at the Court of France, and set him up as a rival to Benvenuto: he was also engaged in a law-suit, but finding himself, as he says, much troubled and persecuted by the delays of the law, he had recourse to his sword, which intimidated his adversaries, and put an end to the suit. The Favourite still continuing to persecute him, he begged permission of the king to leave France. On his return to Florence, the Grand Duke Cosmo de' Medici received him with marks of attention, and gave him a studio to exercise his profession in, where he commenced his celebrated Perseus; but being offended at some conduct of the grand duke's servants, he went to Venice, where he made the acquaintance of Titian, Sansovino, and other celebrated artists. Returning once more to Florence, he proceeded, though slowly, for want of means, with his Perseus, which at last he finished.

ke's declaring war against the inhabitants of

Siena, Benvenuto was employed to repair the fortifications of Florence.

After his Perseus was exposed to public view, his success was so great that he undertook, in gratitude, a pilgrimage to Vallombrosa and Camaldoli. He was now employed upon many important works. The contest between him and Bandinelli for a statue in marble of Neptune is well known: it is said that the chagrin caused by the preference given to Cellini's design caused the death of the rival sculptor. Notwithstanding this, the duchess, who was Benvenuto's enemy, prevented his having the work, and it was given to Ammanati. He had soon after an opportunity of regaining the duchess's good opinion, by presenting to her and the duke a marble crucifix, a work mentioned and highly extolled by Vasari in his Life of Cellini. He was about this time invited by Catharine de' Medici to go to France, to superintend a monument to the memory of her husband, Henry II., but the grand duke desiring to retain him in his employment, the queen dowager relinquished her proposal, and Cellini did not again quit Italy. He died in Florence on the 13th of February, 1570, and was buried with great pomp in the church of the S. Annunziata.

The works of Benvenuto Cellini may be divided into two classes. The first, for which he is most celebrated, comprises his smaller productions in metal, the embossed decorations of shields, cups, salvers, ornamented sword and dagger hilts, clasps, medals, and coins, in which he showed great skill in composition, and excellence in the details of execution. The second includes his larger works, as a sculptor, and a reference to his bronze group of Perseus, with the head of Medusa, in the Piazza del Gran' Duca, in Florence, will be sufficient to illustrate his merit in the higher walk of his art. He also executed some fine portraits.

It might be expected, from the constant employment Cellini had, wherever his uncertain and roving habits induced him to settle even for a short time, that a greater number of his highly-finished works would be found in collections. Their rarity must doubtless be accounted for by the temptation which the intrinsic value of the materials in which he usually exercised his talents offered to tasteless cupidity; and which often no doubt led to the destruction of fine specimens of art for the sake of the gold or silver in which they were worked.

The life of Benvenuto Cellini, written by himself, is, in its class, one of the most curious and interesting biographies extant. It not only contains very full information respecting the life and professional pursuits of an extraordinary individual, and describes all ranks of persons with whom he was connected during a long and busy career, but furnishes a lively and no doubt tolerably accurate picture of the state of society during the greater part of the sixteenth century. Cellini's vanity and self-satisfaction, displayed throughout the work, are excessive and highly ludicrous; and, candid or reckless, he does not disguise the excesses into which an ardent temperament and ungoverned passions too frequently urged him. To the dishonour of those who held the reins of government, and especially in the States of the Church, his narrative shows how easily crime was overlooked when the delinquent had talents (either useful or agreeable to his judges) to plead in his behalf, or courtly interest to protect him from the just consequences of a disregard of the laws.

The best edition of Cellini's life is entitled 'Vita di Benvenuto Cellini da lui medesimo scritta, &c. &c. da Gio. P. Carpani,' whose notes are valuable, 2 vols. 8vo. 1812. There is a translation into English by W. Roscoe. Cellini also wrote a treatise on various branches of his art.

CELLULA'CEA. [CEPHALOPODA.]

CELLULAR TISSUE, one of the primary substances of the animal organization, the simplest form of membrane, that which is conceived to constitute the original structure from which all the others are produced. It is more extensively diffused than any other animal substance, and may be considered as forming the basis of the animal body. 'When in thin slices, cellular membrane appears as a semi-transparent or colourless substance; when examined in thicker masses it is of a whitish or greyish colour. It consists of minute threads, which cross each other in every possible direction, leaving spaces between them, and thus forming a mesh or net work, not unlike the spider's web.' The interspaces between the threads are not, properly speaking, cells, for there are no such distinct partitions as the ter[illegible] The cellular appearance from which this rives its name, results from the intersection of its component threads or fibres in every possible direction. 'These interspaces during life and in the state of health are filled with a thin exhalation of an aqueous nature, a vapour rather than a fluid, rendering and keeping the tissue moist. This vapour consists of the thinner part of the blood, which is poured into the interstical spaces by a process of secretion. When occupying these spaces it makes no long abode within them, but is speedily removed by the process of absorption. In health these two operations exactly balance each other, so that there is no accumulation of the aqueous fluid, but merely enough is effused to keep the tissue always in a state of suppleness.' The cellular thread or fibre is capable of great extension and is highly elastic; and some of the most important purposes which it serves in the economy depend upon its property of elasticity.

When examined by the microscope, the component threads of the cellular tissue appear, according to some observers, to consist of minute particles of a globular figure; according to others, the fibres, which are very distinct, are not composed of globules, although globular bodies are seen at irregular distances, either singly or clustered together; but such globules never present a linear arrangement. The threads consist, it is conceived, of coagulated and condensed albumen. When arranged in the form of membrane so as to constitute cellular tissue, these threads are everywhere penetrated by arteries, veins, absorbents, and nerves, endowing the tissue with properties truly vital. These vital properties are certainly possessed in a less degree by cellular tissue than by any other organized substance; yet, as has been already stated, it is the seat of at least two vital properties, secretion and absorption. However, the most manifest and perhaps the most important purposes which this tissue serves in the economy, depend upon its physical properties of cohesion, flexibility, extensibility, and elasticity.

It is proved by minute and accurate dissection, that cellular tissue is continued uninterruptedly all over the body, and hence that it constitutes the common bond of union between the different regions into which the body is divided, and the several organs contained in them. At the same time it enters very largely into the composition of all the organic solids, many of which are entirely composed of this substance variously modified and arranged.

In this manner the cellular membrane of the body consists of two portions, one of which fills up the interstices which are left between the various organs, and thus unites them with each other; and the other portion closely surrounds the organs, penetrates into their interior, and contributes largely to their formation. The first, called the common or external cellular tissue, has the general extent and figure of the body, constituting the mould of its individual parts; the second, termed the special or internal cellular tissue, envelops the individual organs and enters as a constituent element into their structure. The quantity of the first is by no means the same in all the parts of the body. Considerable masses of it are accumulated wherever there is extensive motion, as in the fore part of the neck, at the flexures of the joints, in the palm of the hand, before the ankle, and in the sole of the foot. Still larger masses of it are collected in the great cavities and surround the viscera, as the liver, the pancreas, the kidneys, &c. Its density is widely different in different situations; in the palm of the hand and the sole of the foot it is firmer and closer in its texture than around the liver or the kidney; and in some places its density is so great that it constitutes a peculiar structure termed fascia; as under the skin of the abdomen, in the perinæum, at the side of the neck, and around the fore-arm and the thigh. It becomes finer as it divides and subdivides, in order to include the more delicate organs. Thus the sheath which it forms to envelope the muscular fasciculus is of a coarser texture than that which it affords to the muscular fibre, and the covering which it gives to the trunk of the nerve of the extremities is firmer and denser than that which it spreads around the soft and delicate nerve of sense. (Grainger and Craigie's *Elements of General Anatomy*, and Southwood Smith's *Philosophy of Health*.)

CELLULAR TISSUE is that kind of elementary organic matter in plants which answers to the flesh in animals. It forms the parenchymatous and pulpy parts, and all those which are allied to them. It may be said to constitute the basis of vegetation, never being absent from any plants, often, as in mosses, forming their entire substance, and always being that among which the woody and vascular tissues penetrate. The pith, the soft parts of the bark, the green web that lies between the veins of the leaves, the flesh of fruit, &c. &c., consist of cellular tissue. When examined with a microscope, it is found to consist of little vesicles of semitransparent matter, adhering with considerable tenacity, and varying in figure from that of a spheroid to a rhomboidal dodecahedron, and thence to prismatical and other forms. It is probable that all the other kinds of tissue are developments or modifications of this; for in most seeds it is the only kind which exists in the embryo, and yet immediately after germination commences, both woody tubes and spiral vessels make their appearance. We must, therefore, conclude either that those organs are modifications of cellular tissue or that they are spontaneously generated. For a full account of the varieties and uses of this kind of tissue, see Lindley's *Introduction to Botany*, second edition.

CELO'SIA, a genus of amarantaceous plants, comprehending the flowers which gardeners call cockscomb [illegible] account of the crested flattened appearance of their inflorescence. The calyx consists of five narrow sharp-pointed sepals, surrounded by some bracts of the same shape and colour as themselves. The stamens are five, and united into a plaited cup. The capsule is membranous, one-celled, opens by a transverse fissure, and contains two or three seeds. The leaves are always alternate. Only two species are cultivated, namely *C. cristata* and *C. coccinea*.

C. cristata, the common cockscomb, is said to be a native of the East Indies, but it is more probable that it came originally from either Japan or China, for it is only seen in gardens in the East Indies. It varies in regard both to stature and colour, some of the sorts being as much as two feet high, while others do not exceed six inches; in colour it is seen with deep blood-red, purple, and yellowish-white combs; the latter, however, is seldom cultivated now.

C. coccinea is by no means so striking a plant as the last in appearance, for it forms little or no crest; but it bears its flowers in panicled spikes. It also is said to be a native of the East Indies, and varies with purple and silvery or yellow flowers.

Nothing can be more easy of cultivation than these flowers; and they are capable of being brought to an extraordinary size by good management. Mr. Knight, the President of the Horticultural Society, gives the following account of the method he pursued to procure a specimen of *C. cristata* of the extraordinary size of eighteen inches in width, seven inches in height, and of the most intense colour. 'In cultivating these plants, I have treated them precisely as I do my pine-apple plants, having in some respects a similar object in view; for in both a single fruit-stalk of great strength is requisite, the protrusion of which should be retarded as long as possible consistently with the rapid growth of the plant. The compost I employed was the most nutritive and stimulating that I could apply, consisting of one part of unfermented horse dung, fresh from the stable and without litter, one part of burnt turf, one part of decayed leaves, and two parts of green turf, the latter being in lumps of about an inch in diameter, to keep the mass so hollow that the water might have free liberty to escape, and the air to enter. Manure was also given in a liquid state by steeping pigeon dung in the water, which was given very freely. The plants were put, whilst very small, into pots of four inches in diameter, and three inches deep; as soon as their roots had reached the sides of the pots, and before they had become in any degree matted, they were transplanted into pots of a foot in diameter, and about nine inches deep. Particular attention was paid to the state of the roots, for I have reason to think that the compression of them in the pot has, under all circumstances, a tendency to accelerate the flowering of plants. Under this mode of treatment the plants became large and strong before they showed a disposition to blossom, they usually divide into many branches (as the pine-apple plant [illegible] also do), which will greatly injure them, if due attention be not paid to remove the side branches when very young. My plants were at all times so placed that their leaves reached within a few inches of the glass, and they were subjected to the same heat (from 70° to 100°) during the summer as my pine-apple plants.'

CELSIUS, ANDREW, born 1701, at Upsal, [illegible] 1744. He must not be confounded with his father (or un[illegible]us Celsius, 1670-1756, a theologian, or with his grandfather Magnus Nicholas Celsius, 1621-1679, a mathematician and botanist. Andrew Celsius joined Maupertuis and his associates in the measurement of the Lapland degree, and afterwards built an observatory at Upsal. He was the first who employed the centigrade thermometer. He wrote various works, of which it will be worth while to note, 1. his astronomical and meteorological observations in the Upsal Acta Literaria; 2. his collection of the auroræ boreales observed in his time in Sweden, under the title 'CCCXVI Observationes de Lumine Boreali, Nuremberg,' 1733.

CELSUS, AURE'LIUS* CORNE'LIUS, appears to have lived in the Augustan age, but this point is by no means settled; and, as Le Clerc observes, some suppose him to have lived under Tiberius, Caligula, Nero, or even Trajan. Yet there is strong evidence in favour of our supposition. Columella, who wrote under Claudius, speaks of 'Julius Atticus et Cornelius Celsus, celeberrimi ætatis nostræ auctores.' (*De Re Rusticâ*, lib. iii. cap. 17.) And in another place he says, 'Nostrorum temporum Cornelius Celsus totum corpus disciplinæ quinque libris complexus est.' (*Ibid.*, lib. i. cap. 1.) Again Celsus, in his preface, after mentioning Asclepiades, says, 'Ex cujus successoribus Themison nuper ipse quoque quædam in senectute deflexit.' Now we know that Asclepiades was a contemporary of Cicero; and Pliny tells us (xxix. 1), that Themison was a disciple of Asclepiades. We may therefore not unreasonably conclude with Dr. Milligan, that Celsus was a contemporary of Horace and Ovid. This probability is strengthened by his style, which resembles that of the best writers of the Augustan age.

Nor has the profession of Celsus been thought to be perfectly ascertained; for it has been conjectured that he was not a practical physician, but an amateur, who wrote upon physic as forming a part of philosophy. The observations of Celsus, however, on the most practical points, exhibit such familiarity with the subject, that it is impossible to suppose they could have proceeded from any but an actual physician; and there are several passages in his work which can hardly be supposed to refer to any thing but his own practice. Thus after mentioning the method adopted by Heraclides of Tarentum in cases of adhesion of the eyelid to the eyeball, he remarks, that he did not recollect to have seen it successful in a single instance (lib. vii. 7).

Celsus wrote treatises on agriculture, rhetoric, and military affairs, as well as on medicine; but all have been lost except the treatise 'De Medicinâ,' and some fragments of his work on rhetoric, published by Sextus Popma. The work on medicine consists of eight books; the first gives a brief account of the history of medicine, and of the regimen to be observed by persons of various constitutions; the second, of prognosis and diet; the third, of the treatment of general diseases by diet; the fourth, of the treatment of partial diseases; the fifth, of medicines and diseases to be treated by them; the sixth, of the treatment of local diseases by medicine; the seventh, of surgical operations; the eighth, of the bones, with their diseases, fractures, and dislocations. Hippocrates and Asclepiades are the chief authors whom Celsus follows. He copies the former when he treats of prognosis and of various surgical operations, where he translates, word for word, a great number of passages; owing to which circumstance he has been called the Latin Hippocrates. But in other points he rather preferred Asclepiades; whence he has been classed by some in the sect of methodists. But not to mention the perfect impartiality with which he speaks of the three principal sects existing in his time, namely, the empirics, dogmatics, and methodists (lib. i., Pref.), his practice shows that he was not a blind adherent of any party. Celsus merited the praise of an eclectic physician, and followed the sect to which he seems to incline, only so far as they followed nature. In opposition to Hippocrates, but in conformity with Asclepiades, Celsus rejects the doctrine of critical days†, which he supposes to be an offshoot of the Pythagorean numbers. Nor did he copy Hippocrates in the great question of bleeding, which he used far more frequently. 'It is not new,' says Celsus, 'to take blood from a vein; but to do so in almost every disease is new. So it is an old practice to bleed young persons, and women who are not pregnant; but it is only of late that boys and old men, and pregnant women, have been bled; as the ancients nion that the earliest and latest periods of life [illegible] this remedy, and were persuaded that a preg[illegible] woman thus treated must miscarry. But experience [illegible]ards showed, that no one of these rules was without an exception, and that other points were more deserving of attention, in order to regulate the treatment. For the important point is not whether the patient is pregnant, or what his age, but what is his strength. Thus if a young man is weakly, or a woman who is not pregnant is not strong, venesection is injurious; for it will destroy any remains of strength. But a vigorous boy, a robust old man, or a strong pregnant woman, may be bled with safety. Yet an unskilful physician may be very much deceived in these points, because those stages of life are commonly deficient in vigour, and a pregnant woman requires strength after the termination of the medical treatment to maintain not only herself but her offspring.' (*De Med.* lib. ii., 10.)

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* His first name is uncertain; Aldus makes it 'Aulus.

† Critical days are those which produce a crisis, or opportunity of [illegible] of the termination of an acute disease. The critical days were supposed [illegible] the third, the fifth, the seventh, the ninth, the eleventh, the fourteenth, and the twenty-first; of these the seventh, the fourteenth, and the twenty-first, were the most important.

Celsus bled in fever when the symptoms were violent, the skin red, and the veins full; in pleurisy; in peripneumony if the patient was strong, but if not, dry cupping was to be employed; in paralysis; in convulsions; in dyspnœa, when it threatened suffocation; in apoplexy; in cases of unbear[illegible]ain; in internal contusions; in spitting or vomiting of blood; and in all acute diseases, when he thought that the patient had too much blood. He also bled in cachexia. These instances show that he bled more frequently than Asclepiades, but not more frequently than modern practitioners, excepting indeed in the article of cachexia. Celsus used cupping glasses, both with and without scarification; but it is remarkable that he does not speak of leeches, though they were used by Themison.

As Celsus differed from Hippocrates on the subject of bleeding, so he did likewise on that of purging. After remarking that the antients purged and administered clysters in almost every disease, he says that aperients injure the stomach, and that the patient is weakened if the bowels are too m[illegible]ed, either by medicine or clysters; and he recommends [illegible] practitioner to abstain from their use in fever.

The [illegible] four books also direct the method of employing gestation, friction, baths, fomentations, and the sudorific treatment. As to diet, patients are to abstain from eating and drinking at the beginning of their maladies, but they must afterwards take food [illegible] moderate quantities.

Among the numerous remedies contained in the fifth and sixth books, but few are to be taken internally; by far the greater number are unguents, plasters, cataplasms, &c. Among the exceptions are three antidotes; the first is a compound of opium (*lacrymæ papaveris*) and aromatics; the second, called ambrosia, and said to have been composed for one of the Ptolemies by Zopyrus, consists of aromatics without opium; the third, again, contains opium, and is the famous Mithridate, by which Mithridates is said to have secured himself against poison. This remedy preserved its reputation for 2000 years, and may be still said to survive in the *confectio opii*.

The seventh and eighth books give a very favourable idea of the progress which surgery had made in the Augustan age. The operation of lithotomy, as described by Celsus, has been much praised and very extensively adopted. Mr. Samuel Cooper observes that it [illegible] longer practised than all the other methods, 'having been continued to the commencement of the sixteenth century; and it was performed at Bourdeaux, Paris, and other places in France, on patients of all ages by Raoux, even so late as 150 years ago. Frère Jacques occasionally had recourse to it; and it was successfully executed by Heister (part ii., chap. 140). A modern author recommends it always to be preferred on boys under fourteen.' (Allan, p. 12.) (*Surgical Dict.* art. 'Lithotomy.')

Among the most remarkable points in this division of his work we may mention the account of cataract, and the operation with the needle for its cure (lib. vii., 7); the twofold treatment of goitre by caustic, and extirpation (vii., 13); tapping in dropsy (vii., 15); the restoration of the prepuce in the circumcised (vii., 25); the employment of the catheter (vii., 26); manual delivery in cases where the child is dead (vii., 29); and the treatment of fractures and dislocations in the last book. Nor will the account given by Celsus of the structure of the human body fail to surprise those who have been told that the antients were ignorant of anatomy.

[illegible] editio of Celsus is that of Nicolaus Florent., 1478. [illegible]st editions are those of Krause, L[illegible]; [illegible] of Vallart, Lutet., 1772; the 8vo. edition [illegible] at Leyden in 1746; and the one edited by Dr. Milligan, second edit., Edin., 1831. Celsus has been translated into several modern languages. There is a translation into English, with notes, critical and explanatory, by Dr. [illegible]ieve, London, 1756, 8vo.

(*Histoire de la Médecine* [illegible] Le Clerc; *Dissertatio de Celsi vita*, prefixed to Dr. M[illegible]'s edition.)

CELSUS. [ORIGENES.]

CELTÆ, the name of an antient race, which, according to the oldest historical records, occupied a great part of central and western Europe. The Celtæ appear to have been divided into two great families, the Gauls (Galli, in Greek Κελταί and Γαλάται), who occupied the country of that name from the remotest epoch on tradition, and who in their own language called themselves Celtæ; and the Cymri, who are by some considered to be the same as the Cimmerians (Κιμμέριοι), who appear to have migrated westwards [illegible] later period from the countries bordering on the sea of [illegible]f, and, advancing along the Danube, to have spread themselves across Germany to the Ocean. The latest inquiries into the Celtic language show a clear affinity between it and the languages called Indo-Germanic by modern philologists. The earlier Greek writers had very confused notions about the Celtæ. Herodotus (iv. 49) places Celtæ at the sources of the Danube, and in the remotest west of Europe, beyond the Cynetes (an unknown people); but he does not mention them in his enumeration of the various nations who furnished the Carthaginians with mercenaries for their Sicilian wars. In the first Punic war we find Gaulish troops in the Carthaginian service. Other Greek writers confound the Celtæ with the Scythians, others with the Germans or Teutones (Fabri *Thesaurus*, art. *Galli et Galatæ*, and references there). The messengers who carried to Athens the news of the burning of Rome by the Gauls (B.C. 382, according to Niebuhr), said that it had been effected by a great host of Hyperboreans, who had come over the icy mountains from the unknown regions of the north. (Plutarch's *Camillus*.) But long before this the Celtæ of Gaul had crossed the Alps, under Bellovesus, into N. Italy, and had become known to the Romans by the name of Galli, 'Gaels,' which seems to have been an aboriginal name of the oldest tribe of the Celtæ settled in W. Europe. Livy and other antient historians fix the immigration of Bellovesus in the reign of Tarquinius the elder; but Niebuhr is inclined to place it at a much later date. It is evident however that there were several immigrations of the Gauls into N. Italy, and at different times. The Galli, who occupied the plain N. of the Po, drove away the Etruscans, but they never conquered either the Veneti, who were settled E. of the Athesis (Adige), or the Ligurians, who occupied the country S. of the Po to the Mediterranean and the river Macra. The various Gaulish tribes that immigrated into Italy are believed to have belonged to the Ædui, Lingones, Ambarri, and Carnutes, who have left traces of their residence in N. Italy. The Insubres are said by some to have been a division of the Ædui. (Bossi, *Storia d' Italia*, vol. ii. ch. 9.) The Cenomani seem to have belonged to a later immigration; they occupied the country of the Orobii, the previous inhabitants of the hilly region about Como and Bergamo. Cato (*De Origin.*) says that the Orobii were not Gauls. The Boii were likewise a later immigration of Gauls, who crossed the Po and occupied the country S. of that river. [BOII.] Lastly, the Senones spread S.E. of the Boii, along the Adriatic coast, as far as Picenum. The Gauls never made a permanent settlement in Italy south of the Apennines.

Contemporary with the first recorded immigration under Bellovesus, another host of Gauls, under Segovesus, crossed the Rhine, and, advancing as far as the Hercynian forest, settled along the Danube, and in the country now called Bohemia, from which they were afterwards driven by the Marcomanni and other Teutonic or German tribes. Some of them penetrated into Illyricum, and settled among [illegible] Illyrians. The Scordisci, south of the Danube, appear [illegible] have been a tribe of Gauls. In very remote times the Celtæ [illegible] Gaul crossed the Pyrenees and conquered part of Spain, where their descendants, [illegible] mixed with the aboriginal Iberians, formed the nation known to the Carthaginians and the Romans by the name of CELT[illegible]I. Some colonies of Ce[illegible]etrated to the W. extremity of Spain, and we find them [illegible]tioned in the antient geographers under the name of Celtici, both on the banks of the Anas (Guadiana) and on those of the Minius (Minho) in N. Lusitania.

The Gauls likewise are said to have crossed the sea into Britain, which they occupied. [BRITANNIA.] But while the Gauls were thus spreading their colonies to the E., the W., and the S., they were themselves pressed upon from the N. by the Cymri or Cimmerians, who appear to have been a branch originally of the same stock as the Gauls, and who had occupied W. Germany. The Belgæ are believed by some to have been a mixed race of Cimmerians and Germans. Appian (*De Reb. Gall.*) says, that the Nervii, one of the chief Belgian tribes, were descendants of Cimbrians and Teutones. The epoch of the great Cimmerian immigration is unknown, and there is much confusion in the antient historical records between the movements of the Cimmerians and those of the original Gauls. We know that the Belgæ occupied the N. part of Gaul and the S. part of Britain, and drove the Gauls farther inland. It appears also that tribes of Cymri occupied the N. W. coast of Gaul, for the Veneti of lower Britanny were called Cymri or Cimbrians, as distinct from Celtic Gauls around them. Diodorus (v. 32) says, that Belgæ was the old name of the Cymri, and he quotes Posidonius, who calls them Galatæ or Cimbrians, while he calls the Gauls by the name of Celtæ. Ammianus Marcellinus (xv. 9) records as a tradition of the Druids that a portion of the Celtæ came into Gaul from beyond the Rhine, and passed afterwards into S. Britain, from whence they drove the original Gauls farther inland. The distinction between Gael and Cymri has been perpetuated, at least in name, down to our days, in the Gaels of Scotland and the Welsh, the language of the latter being called Cymri, as well as that of the Armoricans, or inhabitants of Britanny, while that of the Gaels of Scotland is called the Gaelic. The Cimbri of Marius appear to have been a tribe of Cymri who had settled in N. Germany, or, according to some antient writers, among the Scythians, and from them came the Celto-Scythians, who joined the Cimbri in their westward irruption. (Plutarch, *Marius*.) There is sufficient similarity between the manners and institutions of Gauls and Belgians to make them appear cognate races: both had a powerful Druidical hierarchy; both were divided into optimates, or freemen, and the common people, who appear to have been little better than serfs; both were hasty, violent, and impatient (Niebuhr, *History of Rome*, vol. ii., where he treats of the Gauls and their immigrations); both appear to have been distinct from the Teutonic or German race, as well as from the Iberian and Ligurian.

About 280 B.C. a vast multitude of Celtæ or Gauls invaded Macedonia and Greece. According to Justin they started from Pannonia, where their ancestors had settled long before. It is probable that they were joined by other tribes, either of Celtic Gaul, or of Cymri, coming from W. Germany, or of both. Justin mentions among them the Tectosages, from the neighbourhood of Tolosa, but his account is very confused and contradictory. (Compare b. xxiv. 8, with b. xxii. 3.) The invaders were divided into two great bodies: one under a chief, whom Justin calls Belgius, and Pausanias Bolgos, invaded Macedonia, spreading terror and desolation everywhere before them. Ptolemæus Ceraunus, king or usurper of Macedonia, having attempted to oppose them, was defeated and killed. They made an immense booty, plundered the temples without scruple, and then retraced their course homewards. The other host of Gauls, under Brennus, entered Macedonia the following year, 279 B.C., and defeated Sosthenes, who, after the death of Ceraunus, had assumed the government of that country. Brennus then advanced through Thessalia, and southwards as far as Delphi, with the intention of plundering that rich sanctuary. The Gauls were however put to flight, partly by the resistance of the people of Delphi, and partly, it is said, by an earthquake, which took place during the attack, and which was followed by a fearful storm. These phenomena were attributed to the wrath of the offended God. The attack on Delphi appears to have taken place in 278 B.C. (Clinton, *Fast. Hellenici.*) Brennus, through mortification, killed himself. The Gauls lost vast numbers in the repulse, and still more in their retreat northwards, being harassed by the hostile populations. Another incursion [illegible] Macedonia was made soon after by another host of Gau[illegible] who had not been in [illegible] ic expedition, but had mained on the fr [illegible] nnonia. (Justin, [illegible].) After defeating the Getæ and Triballi, they were met by Antigonus Gonatas, and totally routed. The remnants of these expeditions withdrew into Thrace, where parties of Gauls had been in the habit of making incursions, to the great annoyance of the Byzantines. [BYZANTIUM.] Being however invited by Nicomedes I., king of Bithynia, who was then at war with his brother Zyboethes [BITHYNIA], and being provided by the same with boats, they crossed over into Asia, and effectually supported his claims to the throne. They then settled in the interior of Asia Minor to the [illegible] of Bithynia, and occupied a great tract of country [illegible] ch from them was called Galatia and Gallogræcia. It [illegible] bounded N. by Paphlagonia, W. by Phrygia and Bit [illegible] Cappadocia, and E. by Cappadocia and Pont [illegible] frequent incursions into the neighbouring coun [illegible] ut were checked by Antiochus I., who defeated them, and was in consequence called Soter or Saviour. Three principal tribes of Gauls are mentioned as having settled in the country: the Tectosages, whose principal town was Ancyra; the Tolistobogi, who lived near the sources of the Sangarius, and whose principal town was Pessinus, famous for its temple of Cybele; and the Trocmi, who lived more to the E. near the banks of the Halys. (Leake's *Asia Minor*.) The Galatæ are frequently mentioned in subsequent history as mercenaries in the armies of the kings of Bithynia and of Pontus, and also in those of the later kings of Macedonia and of Syria. They seem to have had their own kings or chiefs, some of whom are mentioned in history; among others, one Cavarus, who acted as mediator between Prusias I. king of Bithynia, and Attalus king of Pergamus. Sestini has given an account of several medals of Cavarus and other kings of the Gallogræci. During the war of the Romans against Antiochus III., the Consul C. Manlius invaded Gallogræcia 189 B.C., for which he obtained the honour of a triumph 186 B.C. (Livy, 38 and 39.) Mithridates the Great, in his wars against Rome, occupied Galatia, and we find the Galatians forming an essential part of his troops. One of their chiefs, however, Deiotarus by name, forsook the part of Mithridates in favour of Rome, in consequence of which he was acknowledged as king by the Roman Senate. It was for the son of this [illegible] called also Deiotarus II., that Cicero pleaded [illegible] After this Galatia became a province of the Roman empire. Several names of places in Galatia attested the relationship of the new settlers to their western brethren, such as Ecobriga, Tolistochora, &c.

The power of the Gauls in Europe was evidently on the decline long before Cæsar's conquest of their country. They were pressed on one side by the Belgæ and the Germans, and on the other by the Iberians, who had settled in Aquitania. The Gauls of Italy had been all subjugated by Rome. The Romans had also occupied the Province of Narbo, which originally belonged to the Celtic Gauls. For the names and localities of Celtic Gaul in Cæsar's time, see CÆSAR; and for those of the Celtæ of Britain, see BRITANNIA.

The distinguishing features, both physical and moral, of the Celtic race, whether Gauls or Cymri, are described by most antient writers, especially Cæsar, Livy, Diodorus, Appian and Justin; but their accounts are not free from contradictions. They were men of large size, of fair complexion, reddish hair, and fierce aspect. They could bear cold and rain, but not heat or thirst. They were vain and boastful, clamorous and impatient of control, and quarrelsome among themselves. Their first onset was formidable, but if once repulsed they easily gave way and dispersed. Their swords were long and unwieldy; those of the Celtic Gauls appear to have been of copper, but they bent after the first blow, which gave a great advantage to the Romans over them. The Gauls fought generally naked down to the loins. Their shields were large and oblong; but they appear to have been slight and ill contrived for protection. Livy (xx. 46) well describes the contrast between the appearance of the Gauls in Hannibal's army and that of the Spanish mercenaries. Their government was aristocratic; the optimates or nobles formed the senate or supreme council: the common people seem to have had no political rights, and to have been in a state of depression. We find that one more powerful tribe, such as the Bituriges and Ædui, exercised, at least for a time, a sort of political supremacy over the neighbouring tribes. Their kings or chiefs appear to have been elective, and to have held their office only for a year or two, unless re-elected. The Druids formed a powerful hierarchy; they were interpreters of the law, and judges in civil and criminal matters. The Druids seem to have been an hereditary [illegible] though not exclusive, being recruited from the young men of noble families who resorted to their [illegible] to [illegible] Cæsar (*De Bello Gall.* vi. 13) gives a good stitutions of the Gauls in his time, which he contrasts with those of the Germans. He says that Druidism was supposed to have come from Britain into Gaul. The religion of the Celtæ was originally a sort of theism; they had no idols or images, against which they showed a particular aversion in their invasions of other countries; they worshipped the Supreme Being in sacred groves. The oak and the misletoe were sacred. They afterwards adopted some of the gods of the Germans and other nations. They had also bards who were not only poets but soothsayers, and their songs were transmitted by tradition. The Druids offered human sacrifices, and they drew omens from certain appearances in the limbs and blood of the victims, and also from the flight of birds. The latter was resorted to in case of emigration to direct their course. Diodorus (v.) says that the Druids had instruments by which they could bring distant objects either on the earth or in the heavens nearer to them. He tells some wonderful stories of the Celtæ or Gauls, which show how little that people were known at Rome even in his time. He says that 'those who inhabit farthest north towards Scythia are the most ferocious, and they are said to devour human flesh, like the Britanni who inhabit Irin (Ireland).' The Celtæ of Gaul had attained a considerable degree of civilization and luxury when Cæsar entered their country. They seem to have been acquainted with the Greek language by means of the colony of Massilia (Marseilles), and the Greek alphabet was in use among them. We do not know of any original Celtic alphabet, nor of any works in their language. Indeed we have no knowledge left of the language of Celtic Gaul, unless we suppose it to have been similar to the Gaelic of Scotland. The Breton language, like the Welsh, is a dialect of the Cymri language belonging to that great division of the Celtæ. It has been long disputed whether the Basque language is a dialect of the old Celtic. W. von Humboldt (*Prüfung der Untersuchungen über die Urbewohner Hispaniens vermittelst der Vaskischen Sprache*, Berlin, 1821) seems to be of opinion that the Basque language is of Iberian and not Celtic origin. The remains of the old Celtic language must therefore be sought in the Gaelic, and in the Erse or Irish, which is said to resemble the Gaelic; and in the Welsh and its cognate dialect, the Breton. These seem to be the only probable offspring of the Celtic Gaul and the Cymri, Cimmerian, or Cimbrian. For further information concerning these two great families, we must refer our readers, besides the antient writers mentioned in this article, to the numerous modern works written professedly on the subject, among others to P. Ramus, *De Moribus Veterum Gallorum*; Jos. Js. Pontanus, *Glossarium Prisco-Gallicum*; Risco, *España Sagrada*; Mannert, *Geographie der Griechen und Römer*; Davies's *Celtic Researches on the Origin, Tradition, and Language of the Antient Britons*; *Mémoires de l'Académie Celtique*; Amédée Thierry, *Histoire des Gaulois depuis les Tems les plus reculés*, Paris, 1828; besides the numerous English works on the Gaelic and Welsh languages and antiquities.

CELTIBE'RI, a people of antient Spain, supposed to have been descended from Celtæ who in remote times immigrated from Gaul, and afterwards became mixed with the native Iberians, so as to resemble in their habits more the latter than the former people. The Celtiberi extended from the right or S.W. bank of the Iberus (Ebro) towards the interior of Spain. They occupied the highlands about the sources of the Duero and the Tagus, and both sides of the great central ridge which divides the waters which flow E. towards the Mediterranean from those which flow W. into the Duero and the Tagus. [Castilla.] The Celtiberi are spoken of by the Greek and Roman writers sometimes as a single people, sometimes as a confederation of various nations. In the latter sense they extended over a great part of central Spain, including the Arevaci, Pelendones, Lusones, Belli, and Titthi. Appian places even the Vaccæi among the Celtiberi. Numantia, in the country of the Arevaci, is said by Florus to have been defended by 4000 Celtiberi. The principal towns of the Celtiberi were Segobriga, not far from Numantia, and different from the Segobriga, now Segorbe, near Valentia; Turiaso, now Tarazona; Bilbilis, the birthplace of Martial, now Calatayud; Argobriga, &c. The Celtiberi were a brave people, superior to the Lusitani in firmness, and they proved formidable both to the Carthaginians and the Romans. After having submitted to Rome in the second Punic war, they repeatedly renewed the contest, fought against Fulvius Flaccus, were subjugated by T. Sempronius Gracchus 179 B.C., revolted a few years after again under the prætorship of Appius Claudius, and were again defeated. They fought afterwards against C. Marcellus and Licinius Lucullus. After the destruction of Numantia by Scipio Æmilianus they were subdued. Their country became part of the Roman Provincia Tarraconensis. (Appian, *De Rebus Hispan.*; Livy, &c.)

CELTIC ARCHITECTURE. Under this term we class the structures or buildings which are usually considered to be Druidical; such as the works of the natives of our island anterior to the arrival of the Romans. The beginnings of architecture are undoubtedly perceptible in the sets or compages of stones (each consisting of two uprights and an impost), which form so striking a feature in the circles of Stonehenge. The upright pillars have evidently undergone shaping; and the mode in which the imposts were secured by mortises and tenons shows a regular principle of construction beyond that of the mere rude masses which mark the Druidical remains of other countries. Cells of the Druidical age are also still to be found of a uniform character; such as in the monument called Ty Iltud, or St. Iltut's hermitage, in Llan Hammwlch parish in Brecknockshire (see Gough's edit. of *Camd. Brit.*, fol., 1789, vol. ii., p. 476), composed of four large flattish rude stones, three of them pitched in the ground, and the fourth laid on them as a cover, forming a cell or hut open in front, about eight feet long, and four wide and high. It corresponds with Kit's Coty House in Kent, and with similar cells in other parts. These latter structures are usually known by the name of Kistvaens, and are by some supposed to have been tombs: they appear at all events to have formed a superior class of buildings; for, according to Diodorus Siculus, the ordinary dwellings of the Britons in summer were for the most part meanly built of reeds or wood. Caverns seem to have been their usual places of dwelling in the severer seasons. A Kistvaen, formerly existing at Rollwright in Oxfordshire, was formed of six stones. (Gough's edit. of *Camd.*, vol. ii., p. 382.) King, in his 'Munimenta Antiqua,' vol. iii., p. 31, gives an account and representation of the tower of Brunless or Brwnllys in Brecknockshire, which he considers an instance of Syrian architecture as used among the Cornish Britons. It is a keep or tower of singular construction, unlike anything Roman or Norman.

CE'LYPHUS, a genus of Dipterous insects of the family *Lauxanidæ* (Macquart). Characters: antennæ wide apart, as long as the head, stylet rather thick and covered with fine hairs; scutellum convex, and covering the abdomen.

This genus is one of the most extraordinary among Dipterous insects, the species having more the appearance of little beetles than two-winged flies; the peculiarity is caused by the immense size of the scutellum, which covers the whole abdomen and encloses the wings when at rest*.

Celyphus obtectus is about one-sixth of an inch in length; the head is yellow; the last joint of the antennæ is black; the thorax and scutellum are of a bluish black colour with violet reflexions; the former is broader than long; the abdomen is fawn-colour, the legs and wings are yellowish, the latter with the base brown. It inhabits Java.

C. scutatus, the only other species known, very much resembles the one just described, but is of a greenish copper colour above and beneath: it is found in the East Indies.

CEMENT, a substance used for causing the adhesion of surfaces, or for covering and protecting them. Cements are of various kinds, comprehending Glue, Lutes, Mastich, Mortar, and Solder: their action is purely mechanical, though in some cases, especially in mortar, it is to a certain extent dependent upon chemical changes occurring in the nature of the cement.

On the present occasion our remarks will be almost exclusively confined to those cements which are not comprehended under any of the heads above named; such, for example, as are intended for temporary use, for mending articles which have been broken, or for replacing damaged parts.

Temporary cements are such as are used for holding articles firmly during the operations of the workmen, and which are easily removed when there is no further occasion for them; thus, in fixing glass plates to blocks to be ground for optical purposes, the following is recommended as a useful cement: melt together four ounces of resin, a quarter of an ounce of bees'-wax, and add four ounces whitening, previously made red hot, while yet warm.

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* In the large size of the scutellum and its covering the wings when at rest, this genus bears a resemblance to the genus Scutellera among the Hemiptera.

cement will also answer the purpose of joining metallic plates to be turned in a lathe.

Chasers of gold and silver articles support and hold their work by a cement formed of pitch, resin, and a very small quantity of tallow melted together, and thickened by stirring in brick-dust; this cement may also be used for fixing small steel articles on the blocks intended to hold them for polishing. In winter more tallow is necessary than in summer. Shell-lac is also usefully employed for holding metals, glass, or precious stones, while cutting, turning, or grinding them; the metal or other substance should be warmed to melt the cement.

Permanent cements are prepared with various ingredients. Thus, supposing ornaments of Derbyshire spar or other similar substances to be injured by being chipped or broken, the parts may be restored by using a mixture of seven or eight parts of resin and one of bees'-wax, with a little plaster of Paris, melted together. The pieces of spar must be heated until they are hot enough to melt the cement, and this being interposed, the parts are to be pressed together; when the cement is used to fill up the place of any small pieces that may have been lost, the quantity of plaster of Paris must be increased. Sulphur also, placed between the heated surfaces of broken stones, makes a good cement; and when little holes are to be filled up, some of the hardened stone should be mixed with the melted sulphur.

Jewellers, in setting precious stones which have been accidentally broken, cement the pieces together by applying mastich between the fragments, which are sufficiently heated to melt this resin; they are then pressed together to force out the excess of mastich. A cement for glass and porcelain is made from a mixture of lime and white of egg; and the same purpose is also answered by dissolving gum arabic in a little water, adding proof spirit and gum ammoniac to it. Another cement for the same use is prepared by mixing three parts of isinglass soaked in warm water for half an hour; pour off the water and add one part of gum ammoniac, previously dissolved in proof spirit of wine; the mixture is to be heated until a drop of the composition becomes instantly stiff by cooling. When used to join broken porcelain or glass, the pieces should be first warmed; the fluid cement should be laid on with a brush, and the pieces pressed together; or, if necessary, tied to prevent their separation.

Japanese cement is said to be prepared by mixing rice-flour intimately with cold water, and then boiling the mixture; it is white, and dries nearly transparent. It is therefore very useful in the manufacture of curious paper articles, which require layers of paper to be cemented together. When made with a smaller quantity of water, models, busts, &c., may be formed of it.

A cement used for steam-engines is prepared as follows: take two ounces of sal ammoniac, one ounce of flowers of sulphur, and sixteen ounces of cast iron filings or borings. Mix them well by rubbing in a mortar, and keep the mixture dry: when it is wanted, take one part of this powder and twenty parts of clean iron borings or filings, and mix them thoroughly by grinding in a mortar; add enough water to give a proper consistence, and apply it to the joints. In this case chemical action goes on, sulphuret of iron being slowly formed, and a great degree of hardness is acquired.

In joining the flanches of iron cylinders, a mixture of litharge, red and white lead, boiled in linseed oil, is made use of. It may be applied spread on flannel, or linen placed between the joints before they are screwed together. The proportions of the ingredients are not important, provided too much oil be not used, so as to make the composition too thin. This cement answers for the joints of stone cisterns intended to hold water.

Coppersmiths lay over the rivets and edges of the sheets of copper in large boilers a mixture of quicklime and ox's blood. It must be applied fresh made, as it soon hardens; this cement is both cheap and effectual. (*Phil.Mag.* vol. xiv.)

According to Mr. Singer, a good cement for electrical apparatus is prepared by melting together about five pounds of resin, one pound of bees' wax, one of red ochre, and about two ounces of plaster of Paris.

CEMENT, PARKER'S. [MORTAR.]

CEMENTATION. [STEEL.]

CEMETERY. [INTERMENT.]

CENCHRIS, a genus formed by Mr. Gray [illegible] one of the subdivisions of Boa. [XIPHOSOMA.]

CENIS, MOUNT. [ALPS.]

CENSER, a vessel used for burning and wafting incense: from the French *encenser*, to perfume. It was called by the [illegible] Thymiatérion θυμιατήριον), and by the Romans [illegible]ulum. The censers of the antient Hebrews were a sort of chafing-dishes, or perfuming-pans, with or without handles, which the high-priest placed on the altar of incense or carried into the sanctuary. St. John in the Revelations (v. 8), speaking of the censers held by the four-and-twenty elders, calls them dishes only, or golden cups full of incense: such probably as occur upon the reverses of the coins of Simon Maccabæus. Josephus speaks of a very large number of golden censers, made by [illegible]mon for the Temple at Jerusalem. A censer with [illegible] issuing from it occurs upon some of the Hebrew silv[illegible] of modern time. Censers are still used in the Roman Catholic worship, and are usually carried by acolytes. (Compare Calmet's *Dict. of the Bible*, 4to., 1797, in voce.)

CENSOR, the name of one of the superior magistrates in antient Rome. There were two officers of this name, *censores.* They were first created A.U.C. 311, when the consuls were too much occupied with the concerns of war to allow of their making the census themselves. (Liv. iv. 8.) At first they were exclusively of the patrician order: the first plebeian who was elected was C. Marcius Rutilus, A.U.C. 411. (Liv. vii. 22.) In 622 both were plebeians, L. Pompeius and L. Metellus. (Liv. *Epit.* lix.) Originally the censors were chosen by the patrician body, the curies (*curiæ*), and their election was confirmed by the centuries: in later times they were chosen by the centuries, and their election was confirmed by the curies; the centuries also passed the law by which the censors formally received their powers: thus the centuries voted twice over. (Niebuhr, vol. ii. p. 394; [illegible] *of Rome,* by the Society for the Diffusion of Useful [illegible]ledge, p. 138.)

At first the censorship lasted for five years, but a law was afterwards passed abridging its duration to a year and a half. (Liv. iv. 24.) The office underwent many changes in the time of the emperors. Julius Cæsar acted for several years as Præfectus Morum, and subsequently was made censor for life. Augustus performed the func[illegible]he office, but refused the title. Under Tiberius the censorship was abolished (Tacit. *Ann.* ii. 33), and no attempt at its restoration was successful.

When one of the censors died, it was not the custom to choose another in his place: it is true this was once done, but in the same lustre Rome was taken. Superstitious reasons prevented a repetition of the experiment. Accordingly, on the death of one, the remaining colleague resigned, and two fresh censors were chosen. (Liv. v. 31; vi. 27.) Their duties originally were the administration of the public property and revenues, registering the citizens according to their different orders, and keeping the land-tax rolls. In itself the office was insignificant, but in the hands of influential persons it was likely to become powerful. (Liv. iv. 8.) The rank of the citizens and the valuation of taxable property were at the disposal of the censors. The power thus entrusted to them naturally grew with exercise, till in later times it became despotic. No order in the state was exempt from their control. They could exclude a senator from the senate-house, deprive an eques of his horse and rank, or remove a plebeian from his tribe. To inspect the manners and guard the morals of the people was a somewhat indefinite commission; and, though parental indulgence and petty family squabbles seem unsuitable subjects for the interference of the state, it is often difficult to determine whether the actions of the censors were in reality over-rigorous, or only conscientiously strict. (Nieb. vol. ii. p. 397.) If a man let his field run wild, the censors considered him unworthy of his order, and forthwith removed him from his tribe. But notwithstanding the immense power which they thus exerted over the rights and privileges of a Roman citizen, no instance is found of their having deprived him of his franchise. When it is said (Liv. viii. 17) that they added new tribes to the old ones, it is not implied that in these cases they acted on their own independent authority, but only that *they,* and *no other* magistrate, proposed to the people the law which effected the addition. (Nieb. vol. ii. p. 399.) They could no more give the freedom of the city to foreigners, than they could take it from citizens.

They could go no farther than the rank and character of the citizen in their punishments. Whenever they thought a man deserved it, they could brand him with public disgrace—a stigma corresponding to *ἀτιμία* at Athens. But of this censorian stigma or ignominy at Rome, there were two kinds. It was inflicted by the censors, sometimes in their own name and authority, and sometimes in the name of a court of law.

only executed. ely *censorian* disqualify a man for the functions of a citizen, eferment to posts of honour: an appeal al- was sometimes actually made from the [illegible] e censors themselves even gmatize one another. (Liv. xxix. 37.) mentions (*Pro Cluent.* 42, 119) an instance of one man, C. Geta, who had been ejected from the senate by L. Me- and Domitius, and was afterwards created cen he who had himself fallen under the cens actually presided over the morals of the d of those very men who had reprehended him. This was never the case when the censors inflicted the sentence for a judicial court. That sentence, once passed, they were unable to revoke. (Nieb. vol. ii., p. 397.) The administration of the public revenues was a part of the business of the censors, and we find them not only establishing tolls and excise duties in subject towns, but actually fixing the price at which salt should be sold in Rome itself. (Nieb. vol. ii., p. 400.) They let to farm the customs and the contracts for public works. They superintended the roads, and took care of the public books and documents. Cases of marriage and betrothing came under their inspection. (Varro, *de L. L.* vi. 71, ed. Müller.) Their acts were registered in public documents; and the purity which was required in those who filled the office is indicated by the circumstance, that those documents were preserved in the temple of the Nymphs. (Cic. *pro Mil.* 27.) The writing was probably performed by public slaves in the service of the censors. (Liv. xliii. 16; Nieb. vol. ii., p. 404.)

The censors might be tried when they acted improperly (Liv. xxiv. 43), and even be led to prison (ix. 34), or thrown from the Tarpeian rock. (Liv. *Epit.* lix.)

There were also censors in many of the municipia, and in the provinces. (Cic. in *Verr.* ii. 53.)

In modern times an officer has been appointed in different countries under the title of *censor*, whose business has been to examine all books previous to their publication, and to see that they contain nothing which the government considers immoral or heretical. In England before the revolution there was an officer of this kind.

CENSUS, THE, at Rome was a numbering of the people, and a valuation of their property. It was held in the Campus Martius. (Liv. iv. 22; Varro *de R.R.* iii. 11.) Every Roman citizen was obliged, upon oath, to give in a statement of his own name and age, of the name and age of his wife, children, slaves, and freedmen, if he had any. The punishment for a false return was, that the individual's goods should be confiscated, and he himself scourged and sold for a slave. Taxation depended on the results of the census; many kinds of possessions and of actual property were excepted, while, on the other hand, some sorts of property were assessed at several times their value. Constant changes were made by successive censors in the valuation of taxable property. Cato and Flaccus rated the taxable value of high-priced slaves at ten times the purchase-money. (Nieb. vol. ii. p. 402.)

According to the valuation of their property at the census, the citizens were divided into six classes; each class contained a number of centuries or hundreds. That a century did not always consist of a hundred men is clear, from the fact that the richest centuries were the most numerous, and consequently must individually have contained fewer persons than the centuries of the poor. (*Hist. of Rome*, by the Society for the Diffusion of Useful Knowledge, p. 21.) The first class consisted of those whose property amounted to 100,000 *ases*, about 322*l.* 18*s.* of English money: the second class consisted of persons worth 75,000 *ases*; the fortune of the third class amounted to 50,000 *ases*; that of the fourth to 25,000; that of the fifth to 11,000; and the sixth class included all below the fifth, even those who had no estate whatever. This was naturally the fullest of the six, but was accounted only as one century. Now, as the richer classes contained far more centuries than the poorer, so much so that the first class contained more than all the rest together, and as the votes in the *Comitia Centuriata* were taken within the centuries individually; and then the vote of the majority of centuries was decisive, it is obvious that the influence of wealth was greatly preponderant in this assembly. Cicero (*de Repub.* ii. 22) assigns this as the object aimed at in the institution. The real object of the *Comitia Centuriata* was (as Niebuhr supposes) to bind the different orders of the state together in one consistent and organised body. Every one in the nation had a vote on national business; and in this assembly was laid the basis of popular liberty. (See *Rev. of Niebuhr, Edin. Rev.* CXII. p. 293.) In the *Comitia Centuriata* the people always appeared under arms, and each class had a particular kind of armour assigned to it.

The census was held at first by the kings, afterwards by the consuls; and, from A.U.C. 311, by the censors. After the census a sacrifice of purification was generally, but not always (Liv. iii. 22) offered. The victims were a sow, a sheep, and a bull, which were led thrice round the army, and then slain: the sacrifice was called *Suovetaurilia*.

It does not appear that the census was held with strict regularity. It was sometimes altogether omitted. (Liv. iv. 8; Cic. *pro Arch.* 5. 11.) The usual interval was five years; and in allusion either to the sacrifice of purification, or to the farmers paying their taxes at this time (Voss, *Etymolog. Ling. Lat. in lustrum*), the interval was commonly called a lustre (*lustrum*). It is obvious that the census must have been of great use in ascertaining the actual strength and capabilities of the state.

When a person was duly entered on the books of the censors, this was taken as a proof of his citizenship, even if he were a slave, provided he had been registered with his master's consent (Cic. *de Or.* i. 40; Ulp. i. 8); but many enactments were made to regulate and modify this legal principle. As the census was held at Rome, citizens who were in the provinces, and wished to be registered, were obliged to repair there on that occasion (Cic. *ad Att.* i. 18, &c.): but this was sometimes evaded, and was made a matter of complaint by the censors. The census, accompanied with the ceremony of the lustrum, seems to have fallen into disuse after the time of Vespasian; but the numbering of the population, &c., continued till a late epoch of the empire.

As to the census in the provinces, under the empire, see Tacitus (*Ann.* i. 31, 33, &c.), and the *Excursus* of Lipsius. See also *Dig.* 50, Tit. 15. [DE CENSIBUS.]

The term *census* is also used in Latin authors to signify the amount of a person's estate, and hence we read of *census equester*, the estate of an eques, and *census senatorius*, the estate of a senator. (Pitisc. *Lex. Antiq. Rom.*)

CENSUS. The first attempt to ascertain the population of England, and to determine its increase or otherwise, by ascertaining the number of births and burials, was made in the 18th century. This method could at best afford only an approximation towards the truth, which can only be satisfactorily ascertained by actual enumeration; while, as regards the important questions of the condition of the people and their means of subsistence, it is clear that deductions drawn from registers of births and burials, if even they were perfectly accurate (and in this country they never yet have been so), would give no information whatever.

It was provided, among the articles of the Federal Constitution, that a census of the people in the United States of America should be made 'within three years after the first meeting of congress, and within every subsequent term of ten years.' The first census was taken in 1790, and the fifth, hitherto the latest, in 1830. In the United States, the object of the census being merely the apportionment of the number of representatives according to the population of the several states, the inquiries have not been extended beyond obtaining the numbers and ages of the people, distinguishing between the sexes, and between free persons and slaves. No inquiry has been made as to any of those circumstances which indicate the progress of the people in wealth and civilization. That this progress has been great and constant may indeed be fairly inferred from the rate of increase of the people, which has been great beyond all means of comparison afforded by the older settled countries of Europe.

In 1791 a committee of the Constituent Assembly of France was appointed for the purpose of ascertaining the numbers of the people in that country. Since that time considerable care has been taken to keep an accurate record of those numbers by computations, from year to year, derived from strictly enforced regulations as to the registration of births deaths, and by decennary enumeration—the last, and bly the most accurate of which, was made in 1831. of the police, and of the other civil institutions of France is favourable for obtaining information upon many ches connected with this subject; and the French government has availed itself of these means to a considerable extent, for ascertaining the actual condition of the people.

The first actual enumeration of the people of England

and Scotland was made in 1801, and subsequently in 1811, 1821, and 18[illegible] In Ireland the earliest enumeration was made in 1813, since which time a census has been taken, as in Great Britain, in each of the years 1821 and 1831. It will be sufficient here to explain the heads of inquiry embraced on the last of these occasions, and the method pursued for obtaining information. The actual collection of that information was entrusted, in England, to the overseers of the poor, and in Scotland to the parochial schoolmasters. In Ireland, where there are neither overseers of the poor, nor parochial schoolmasters, the task was entrusted to persons chosen and appointed by the chairman and assistant barristers, the recorders of cities and towns, and the magistrates assembled in sessions for the purpose; one person being so appointed in each parish, with power to call for the assistance of the churchwardens and constables of the parish. The persons thus appointed in the different divisions of the kingdom were 'respectively required to take an account of the resident population, by proceeding from house to house on the 30th day of May, 1831, and on the days immediately subsequent thereto, if one day was not sufficient; and they were also required to specify in writing the name of the parish or place, and whether it be usually called a parish, township, tithing, quarter, or by what other denomination. Individuals to be numbered only in those parishes, &c., where they severally happen to be at the time of taking the account.'

The questions, answers to which were to be thus collected, were sixteen in number, viz.:

1. How many inhabited houses are there in your parish, township, or place, and by how many families are they occupied?

2. How many houses are now building, and therefore not inhabited?

3. How many other houses are uninhabited?

4. What [illegible] mber of famil[illegible] your parish, township [illegible] or pla[illegible] are chiefly employ[illegible] in and maintain[illegible] agriculture? or by t[illegible] de, m[illegible] ufacture or handic[illegible] ft? and how many [illegible] comprised i[illegible] of the two preceding classes?

5. How many persons (includ[illegible] children of whate[illegible] re there actually found within the limits of [illegible] ur parish, township, [illegible] at the time of taking this account distinguishing [illegible] and female [illegible] sive of men actually ser[illegible] in his majesty's [illegible] forces, or in the militia [illegible] d exclusive of seamen, [illegible] in his ma[illegible] or belonging to registe[illegible] ssels?

6. How [illegible] of the mal[illegible] to the 5th qu[illegible] upwards of [illegible] ears old?

7. How [illegible] males upw[illegible] rds of 20 years old ar[illegible] employed in [illegible] griculture, including g[illegible] keep[illegible], and othe[illegible] arm servants gardeners, (not taxed or taxal[illegible] od nurser[illegible]

In answering this question, the males are to be carefully distinguished into three classes, viz., first, occupiers of land, who constantly employ and pay one, or more than one, labourer or farm servant in husbandry; secondly, occupiers of land who employ no labourer other than of their own family; thirdly, labourers in husbandry, and farm servants employed by occupiers of the first class.

8. How many males upwa[illegible] old are employed in manufactures, or in making manufac[illegible]

9. How many male[illegible] ups[illegible] old are employed in retail trade, or in handicraft, as masters, jo[illegible] men, shop[illegible] apprentic[illegible] other capacity requiring skill in th[illegible] siness?

10. How m[illegible] ale[illegible] of 20 ye[illegible] old [illegible] chants, bankers, capi[illegible] ons [illegible] rtis[illegible] rchit[illegible], te[illegible] che[illegible] s, clerks, surveyo[illegible] [illegible] ated men, including g[illegible] erall persons [illegible] ntaining thems[illegible] wise than [illegible] nufacture, trade, or bodily labor

Ho[illegible] many male[illegible] of 20 years old are miners, fishermen, bo[illegible] atmen of can[illegible] el-makers, toll collectors, or labourers emplo[illegible] of the thr[illegible] preceding classes [illegible] questions 8, 9 and 10) or oth[illegible] yed in any k[illegible] nd of bodily labour [illegible] excepting in agriculture?

[illegible] many other [illegible] males upwards of [illegible] years old (not being taxable [illegible] r the next q[illegible] stion) have not be[illegible] included in any of the forego[illegible] uding therefore, in [illegible] nswer to this question, retired trades[illegible] superannuated labourers, and m[illegible] or disabled in body or mind?

13. How many household servants, [illegible] ding all female servants, and such male servants (of whatever age) as [illegible] ed or taxable as such and attendants at inns, distinguish[illegible] males upwards of 20 from the males under 20 years of age.

14. If you have entered any males in answer to question 8, specify the manufactures in which they are employed, and what proportion of the number of those entered in answer to question 11 are employed in any quarry, mines, coal-pits, or public work in progress?

15. Referring to the number of persons in 1821, to what cause do you attribute any remarkable diffe[illegible] in the number at present?

16. Are there any other [illegible] ers which you may think it necessary to remark, in explanation of yo[illegible] nswers to any of the preceding questions?

The attempt made on this occasion to classify the population in respect of age, was limited to the division of males into those above and those below 20 years. At the enumeration in 1821 a question, regarding the ages of persons, was addressed in the following terms to the overseers and other persons employed: 'If you are of opinion that in making the preceding inquiries, the ages of the several individuals can be obtained in a manner satisfactory to yourself, and not inconvenient to the parties, be pleased to state the number of those under 5 years—of those between 5 and 10 years—10 and 15—15 and 20—20 and 30,' and so on in each following decennary period of life to the age of 100, adding further the number of persons above 100. It has been cause for surprise, that notwithstanding the thus given, a very considerable proportion of the ages of males and females should have been obtained. That proportion in the different divisions of the kingdom was as follows:—

In England	9,836,461	out of	11,261,437
Wales	700,210	„	717,438
Scotland	1,956,706	„	2,093,456
Ireland	6,793,230	„	6,801,330
United Kingdom	19,280,607	out of	20,873,[illegible]61

or very nearly twelve out of every thirteen persons in the entire kingdom, while in Ireland there is a deficiency in this part of the statement of only one person in each 850 inhabitants.

CENTAUR, in mythology, a compound of horse and man, supposed to have sprung from the amour between Ixion and the Cloud, which he mistook for Juno: their name has been thought to point to their origin (κεντ-εῖν, αὔρ-αν); but this explanation can hardly be admitted. It is not improbable that their existence may have been imagined from the first sight of a man on horseback, and as their history makes them neighbours of the Lapithæ, it is likely that they were merely one of those Thessalian tribes among whom the far-famed cavalry of that nation took its rise. They are also called Hippocentaurs. Palæphatus' account of the origin of their name (ἀπὸ τοῦ κεντεῖν τοὺς ταύρους) is a mere invention, and, in point of etymology, quite inadmissible.

The battle of the Centaurs and the Lapithæ forms the subject of the metopes of the Parthenon, part of which are now in the British Museum; and also one of the two subjects represented on the Phigaleian frieze, which is also in the British Museum.

CENTAU'REA, a very extensive genus of plants, belonging to the Cynaraceous division of Compositæ, but comprehending no species of any importance to man. *Centaurea Cyanus*, the common blue-bottle of corn fields, is sometimes cultivated for the sake of its many-coloured flower-heads. Two others, *C. moschata* (the purple and white sultan of gardeners), and *C. suaveolens* (yellow sultan), are occasionally seen among other annuals in gardens; but the greater part are to be found only in botanical collections many are mere weeds.

CENTAURUS, the Centaur, a southern constellation, a very small part of which rises in our latitude. It is situated under Virgo and Libra, and is evidently connected with LUPUS and ARA. From Ptolemy's catalogue, it is evident that he considered the Centaur as holding the wolf (or wild beast, as it is called) in one hand, and a thyrsus in the other; and from the proximity of the altar, it is plain that a sacrifice is alluded to. According to Grotius (notes on Aratus), the thyrsus antiently had a hare hanging from it. In some older figures, the Centaur holds a spear in both hands, which sustains the wolf, passing through its head. Hygínus makes only one constellation of Centaurus and Lupus.

No. in Catalogue of			No. in Catalogue of		
Flamsteed, Piazzi ( ), La Caille, C.	Astron. Society.	Magnitude.	Flamsteed, Piazzi ( ), La Caille, C.	Astron. Society.	Magnitude.
1	1562	4½	(231)	1582	3
2	1573	4½	(246)	1588	5
3	1579	4½	(249)	1589	5
4	1580	4½	(267)	1595	5
5	1604	2½	(288)	1602	5
(1)	1512	5	1004 C	1333	4
(53)	1527	3	1025 C	1360	4
(92)	1433	4	1064 C	1395	3
(99)	1542	4	1068 C	1401	4
(109)	1644	[illegible]	1086 C	1431	5
(112)	1544	[illegible]	1093 C	1456	5
(146)	1553	6	1098 C	1463	3
(149)	1462	5	1114 C	1485	5
(150)	1661	5	1126 C	1501	5
(197)	1570	4	1155 C	1554	3
(198)	1572	4	1165 C	1596	1
(205)	1483	5	1226 C	[illegible]	4
(216)	1693	3	1227 C	1634	1

CENTIGRADE means divided into one hundred degrees. The centigrade thermometer of Celsius divides the interval between the freezing and boiling points into 100 degrees. Thus 100 centigrade degrees are equivalent to 180 of Fahrenheit; and to turn the reading of a centigrade thermometer into that of Fahrenheit, proceed as follows:—Multiply by 2 and 20, subtract, divide by 10, and add 32. Thus for 78° centigrade

78

156
1560

1404   140·4
32

172·4 Fahr.

CENTIPEDE. [SCOLOPENDRA.]

CENTLIVRE, SUSANNA, was the daughter of a Lincolnshire gentleman named Freeman, who, being a dissenter and zealous parliamentarian, was compelled, upon the restoration of Charles II., to seek refuge with his wife in Ireland, in which kingdom it is presumed that Susanna was born, about the year 1680. At three years she lost her father, and before she had attained her thirteenth year, she was left by the death of her mother completely an orphan, and according to some accounts utterly destitute. As the scandalous story which Whincop relates of her does not appear to have any foundation in fact, we gladly pass over it, and come at once to her marriage at the early age of sixteen to a nephew of Sir Stephen Fox. A twelvemonth had scarcely elapsed before death deprived her of this new protector. But the wit and the beauty which had probably been the only dower she brought the first, soon procured her a second husband, an officer of the name of Carrol, to whom she appears to have been much attached. About a year and a half after the marriage, this gentleman had the misfortune to be killed in a duel, and Mrs. Carrol became a second time a widow. In this state of desolation and distress she first applied to her pen, as well for support as for the amusement of her lonely hours, and several of her early productions were published under the name of Carrol. Among the first was a tragedy, called 'The Perjured Husband;' but the natural bent of her genius being towards comedy, we find but one more serious drama amongst the nineteen which bear her name. Such was her attachment to the stage, says her biographer, that she became herself a performer, but her success does not seem to have been great, and her stay in it was of short duration. In 1706, while sustaining the character of Alexander the Great, in Lee's Rival Queens, at Windsor, where the court then was, she won the heart of Mr. Joseph Centlivre, Yeoman of the Mouth, or Principal Cook to Queen Anne, and eventually married him. They lived happily together for some years, and she died at his house in Spring Gardens, December 1, 1723, at the age (if the time of her birth be rightly stated) of forty-three. Of her dramatic works, an alphabetical list is given by Baker in his 'Playhouse Companion;' but only three out of the nineteen there enumerated keep possession of the stage:—'The Busy Body,' 'A Bold Stroke for a Wife,' and 'The Wonder.' The first was greatly objected to by the actors, and Mr. Wilks for some time refused to play in it: even the audience came prejudiced against it to the theatre. The second was also pre-condemned by Wilks, who is reported to have said, coarsely enough, that 'not only would her play be damned, but she herself for writing it.'

CENTRAL AMERICA comprehends the countries which, under the dominion of Spain, were known by the name of the kingdom of Guatemala. It forms the central portion of the long isthmus which unites North and South America, and extends from 8° to 18° N. lat., and from 82° to 94° W. long. Its greatest length from S.E. to N.W. may be about 1000 miles; its breadth varies from 100 to 300 miles.

Humboldt, in 1811, estim[illegible] the surface of Central America at 26,152 French square leagues, or 198,765 square miles; but in 1[illegible] he reduced it to 16,740 leagues, or 127,224 square miles. Dunn allows 22,000 square leagues, or 167,200 square miles. This last statement does not differ much from the first of Humboldt, because the state of Chiapa, which contains about 36,000 square miles, had in the meantime been separated from Central America. The estimate of Dunn may probably have been made with a certain degree of accuracy; but it depends on old maps and charts, and the numbers are somewhat too large. In 1[illegible] the eastern shores of Central America were surveyed by Commodore Owen, who ascertained that the coast south of Cape Gracias á Dios had been laid down in the charts from 25′ to 30′ too far to the east. This diminishes the surface of Central America by 8000 or 9000 square miles. Supposing the average width of the country to be 150 miles (which is perhaps near the truth), and its average length 1000 miles, we obtain an area of 150,000 square miles, or the extent of the British Islands and about one-third more.

Its boundary is mainly formed by the Atlantic Ocean on the E. and N.E., and by the Pacific on the S.W. At its south-eastern point it borders on the republic of New Granada, on the department of I[illegible]; the line of separation runs from Cape Burica on the Pacific nearly due north to the Atlantic, a few miles west of the Laguna de Chiriqui. Its most northern part extends between the British settlement of Balize and the United Mexican States; the boundary line between the republic and the neighbouring countries has not yet been exactly determined. It is still asserted in nearly every geographical work that the Andes continue through the Isthmus of Panama, and that the elevated Cordilleras of Peru and New Granada are connected with the Rocky Mountains of the United States by a continuous range; but this conveys an erroneous idea of that portion of America. Properly speaking, there is no elevated mountain-range between 7° N. lat., where the Andes terminate, and 33° N. lat., where the Rocky Mountains begin, at least not such a range as can be compared with the Andes in South, or the Rocky Mountains in North America. The Andes of South America terminate as it seems abruptly at near 7° N. lat., and are followed by a plain which, extending through the Isthmus of Panama, terminates W. of the Bay of Parita. This plain, following the nearly semicircular bend of the isthmus, is about 280 miles in length. The south-eastern half of it, contiguous to the northern extremity of the Andes, appears to be a level tract, very little elevated above the sea. The western half is partly hilly and partly level; but the high lands which extend between the Bay of Mandinga and the mouth of the Chagre for 90 miles, probably nowhere rise to more than 1500 feet; their direction is due east and west, and consequently perpendicular to that of the Andes. They are followed by another low plain, on which some isolated hills rise about 500 feet above it.

The second section of the isthmus extends from the Gulf of Parita to the country which lies between the Gulf of Nicoya and the mouth of the Rio de S. Juan. It is about 280 miles in length. This part of the isthmus is nearly unknown, not having been visited by Europeans. According to the prevailing opinion it consists of a mass of mountain-rocks, about 2000 or 3000 feet high, which contain some extensive plateaus and a few peaks, mostly of volcanic origin. Between 10° 30′ and 13° N. lat. extends the plain of Nicaragua, which is about 175 miles long from south to north, and nearly as much from east to west. It is very little elevated above the sea, the lake of Nicaragua, which covers a considerable portion of it, being only 134 feet above the Pacific. It is separated from the Pacific by a range of low volcanic hills, very few of which rise to more than 700 feet above the sea. The country which lies between this plain and the southern coast of the Gulf of Honduras, and terminates on the west at the Isthmus of Chiquimula, is very little known. Its eastern portion, up to the meridian of 85°, is probably a low plain, with hardly a hill upon it. The western part is a hilly country, traversed by several (at least four) ridges, running west and east. The intermediate valleys open in general to the east, and most of them terminate on the eastern plain. The northern and southern ridge are best known. The northern ridge, running along the Gulf of Honduras, rises perhaps to the mean height of 3000 feet, but declines towards the eastern extremity, not far west of the Rio Patook. The mountain of Omoa is 7000 feet high, and that of Congrehoy 7[illegible] feet. The southern ridge divides the waters which [illegible] e Pacific from those which fall into the Atlantic. [illegible] tains any considerable elevation in a few isolated volcanic peaks. It seems to be rather a table-land of uneven surface, and of little width, though of g[illegible] The intermediate ridges are entirely unknown.

The Isthmus of Chiquimula extends, on the Atlantic, from the mountains between Omoa and the mouth of the Rio Motagua to the innermost corner of the Gulf of Honduras; and on the Pacific, from the harbour of Acajutla to the mouth of the Rio Esclavos. At less than 20 miles from the Pacific there is a broad-backed range of high ground, a continuation of the southern range of the hilly country of Honduras, which unites Honduras to the table-land of Guatemala. The country north of this range is traversed by high and steep hills running east and west, and so closely united to the table-land of Guatemala that they must be considered as offsets of it. The valleys between them are commonly of moderate width and low. The distance between the two oceans, across this isthmus, is about 150 miles.

The table-land of Guatemala occupies all the countries between the isthmus of Chiquimula and that of Tehuantepec in Mexico; the high land in the interior of the peninsula of Yucatan forms its north-eastern projection. Near its southern borders, about the town of Guatemala, it is nearly 5000 feet above the sea; and this may be considered as the mean height of that portion which is south of the Rio Motagua. But north of this river the country rises higher. The most elevated part of it appears to lie between the towns of Totonicapán and Gueguetenango (15° 30′ N. lat.) From this point it begins to lower gradually, and its north-western edges, which belong to the Mexican State of Chiapra, are indented by deep and sometimes wide valleys. No continuous range of any considerable elevation traverses this plain, the surface of which is slightly undulating, like the central parts of England; but here and there it is traversed by a range of hills, about 200 or 300 feet above the plain. The descent from this plain to the low shores of the Pacific is extremely steep, and consequently when seen from that side it has the appearance of a mountain-range, an illusion which is confirmed by a few lofty volcanoes standing near the edge of this descent. The most remarkable are the two volcanoes of Guatemala, situated to the north-west of the town of New Guatemala, of which the Volcano de Agua (or water volcano), according to Col. Galindo, is 12,620 feet high, and the Volcano de Fuego (the fire volcano) somewhat higher. The low country between the Pacific and the table-land, which rises above the plain like a wall, is very level, and measures from 20 to 30 miles across. The eastern border of the table-land, by which it descends to the Gulf of Honduras, is not so distinctly marked, being cut by deep valleys, between which the high land takes the shape of ridges, which extend to a great distance, and in some places, as between the Rio Motagua and the Golfo Dulce, advance to the very shores of the sea. The country between the table-land and the Gulf of Honduras may therefore be considered as a succession of valleys and ridges, except the part to the west and north-west of the Golfo Dulce, which is a low plain.

The difference in the elevation of the surface, which in Central America is perhaps greater than in any other country of equal extent, or at least varies more frequently, produces a corresponding difference in the climate and productions of the natural divisions of the country. The great plain of Nicaragua, with that to the north of it, on the shores of the Caribbean Sea, is only wooded along the rivers. Between the rivers, and along the coast, it forms extensive savannahs, covered with a rich verdure, and presenting occasionally a clump of high trees. The low hills, however, which rise on it, are mostly wooded, especially on their declivities. The climate of these plains being excessively hot and moist, the Spaniards have not formed any settlements on this extensive tract, and it is only inhabited by independent aboriginal tribes. The low plains along the Pacific average from 20 to 30 miles in width, west of the Rio Esclavos; but east of it, only from 10 to 20, or even less: they are covered with an uninterrupted forest of high trees, many of which furnish valuable timber and dye-woods. The heat is excessive, the thermometer rising frequently to 90° and higher, but the climate is considered much more healthy. European settlements are very rare, and the scanty population is almost entirely composed of Indians.

As in other parts of Spanish America, the European settlements have been formed on the high table-lands. That of Guatemala is nearly without trees, and even bushes, except on the declivities of the hilly ranges, which traverse it in every direction. Its climate is that of an eternal spring, the thermometer during the whole year scarcely varies. The average heat in the middle of the year may be considered to be from 68° to 70°; but during the north-west winds it sometimes, though rarely, descends 20° within a few hours. The hilly districts, whose highest ridges rise to the elevation of the table-land only in a few isolated peaks, have a more variable climate. In the valleys, along the Atlantic, there hardly passes a day without rain. They are nearly uninhabitable by Europeans, and even the Indians are far from being numerous; but they display the whole vigour of a tropical vegetation, being clothed with numerous species of trees, shrubs, and plants. Those [illegible] from which the air of the sea is intercepted by ranges of hills are less damp, and more habitable, but their fertility is not so great. This is particularly the case with the valleys of Honduras.

On the table-land, and in the districts not contiguous to the Caribbean Sea, the dry season begins about the close of October, and lasts until the end of May; during which time only a few showers occasionally refresh the air. In the beginning of June thunder is frequent, and is followed by long and heavy rains. But even during this time it rains only in the evening and the night; from six o'clock in the morning till three or four o'clock in the afternoon, no cloud passes over the sky, and the air is dry and pleasant. Towards the middle of October the north winds set in with frequent thunderstorms, and after them the dry season begins.

The north winds (*los nortos*) prevail during the whole of the dry season, and then, in the months of November and December, thin ice is formed on the highest portion of the table-land, and snow falls on the most elevated peaks. These winds blow with considerable force, and seem to pass over the isthmus, and to produce the north-eastern and north-north-eastern winds, which render the access to the shores of the Pacific difficult and dangerous during the dry season. On this coast they are called *Papagallos*. Towards the end of the rainy season, in the months of August and September, the same coast is subject to violent storms from the south-west, called *Tapayaguas*.

Few countries, even in South America, are so subject to earthquakes, and contain so great a number of volcanoes. Many of the hills between the lake of Nicaragua and the Pacific are volcanoes, and most of them are active. The number does not decrease to the north-west of the lake, several of them occurring on the southern and eastern shores of the bay of Conchagua. In this district, which is hardly more than 180 miles in length, above twenty volcanoes are known to exist. Farther to the north only isolated volcanoes occur at considerable distances from one another, on the edge of the table-land. There are also a few volcanoes on the south-east of the lake of Nicaragua. Earthquakes are most frequently felt on the table-land, where they occur annually at the setting in of the northern winds, but the most violent take place at the end of the dry or the beginning of the rainy season. Old Guatemala was almost entirely destroyed by an earthquake on the 29th of June, 1773, and New Guatemala suffered very much on the 23rd of April, 1830.

The table-land and most of the hilly districts are considered very healthy. The goitre is common, especially among the mixed race, and here, as in Switzerland, it is often attended with idiotcy. The whole of the shore of the Caribbean Sea is very unhealthy: malignant fevers prevail there all the year round, owing to which these extensive tracts are very thinly inhabited. The low plain along the Pacific is much more healthy.

The river S. Juan falls into the Caribbean Sea, near 11° N. lat. It was till lately supposed that, by means of this river and the lake of Nicaragua, an easy communication could be opened between the Atlantic and Pacific; but the difficulty of effecting this communication appears to be great, though not insuperable. The river S. Juan is only the channel by which the lake of Nicaragua discharges its waters into the Atlantic. The lake or lagoon of Nicaragua is an inland sea, of a lengthened form, being about 120 miles long and 40 broad where widest, without narrowing much at either end. Its circuit is near 400 miles. It is deep enough to be navigated by vessels of considerable size, having at some distance from the shores from six to twenty fathoms of water along the southern and western banks. It is only very shallow along the north-east shore for a mile and upwards into the lake. It contains several islands, among which that of Ometepec, near the south-western bank between Granada and Nicaragua, is remarkable for a high volcano, and for its fertility and great population, being in-

[illegible] by 3000 or 4000 Indians. The river issues from the [illegible] extremity, and near the fortress of S. Carlos it is [illegible] feet broad, and from six to seven deep. About the middle of its course the S. Juan receives from the south Rio S. Carlos and lower down the Serapiqui. About 28 miles from its mouth the river divides into two [illegible], of which the southern and wider is called Rio Col [illegible] other enters the sea near the harbour of S. Juan de Nicaragua. The depth of water in the upper part of the course of the S. Juan varies from nine to twenty feet, but in some places it is so shallow that rapids are produced. The greatest of these rapids is about 28 miles from the lake. The lower portion of the river, below its bifurcation, is generally very shallow: at many places during the dry season there are not more than two feet of water. The port of S. Juan de Nicaragua is not considered very unhealthy, and the harbour is deep enough for merchant vessels, and safe; but up to the present time it is nearly uninhabited. The most north-western mouth of the river, which is the only one that can be used, has a bar with only two or three, and seldom four, feet water upon it. Haefkins is of opinion that the cutting of a canal through the plain from the port of S. Juan to the lake of Nicaragua, would be less expensive than to make the river navigable. He estimates the distance in a straight line at less than 60 miles. The winding course of the river amounts to 120 miles. Other obstacles present themselves to the attempt of uniting the lake of Nicaragua with the Pacific by a canal. The difference of level between the lake and the sea is 134 feet, and therefore locks would be necessary. Two places seem to offer peculiar advantages for such a canal: the narrowest portion of the isthmus which separates the lake from the Pacific is between the town of Nicaragua and the port of S. Juan del Sul, where it is only 15 or 16 miles across: but the hills upon it rise to between 400 and 500 feet. The hills might perhaps be avoided, but the canal would of course be longer. Some persons think that it would be more advantageous to unite the lake of Managua by a canal with the harbour of Realejo. The country between them is nearly level, and of a firm soil, without being rocky. Besides this, the canal would terminate in the port of Realejo, one of the best harbours on the west coast of America, while that near Nicaragua would end in the harbour of S. Juan del Sul, which is small and unsafe. But this canal would be more than twice as long as the other, and, in addition to this, the Tepitapa, which unites the lake of Nicaragua with that of Managua, must be rendered navigable. The lake of Managua is 150 miles in circumference, 35 miles long, and 15 broad in its widest part. It is deep enough for vessels of considerable size; but the Rio Tepitapa, which brings down the water from the lake of Nicaragua, and is about 25 miles long, has falls which, in the dry season, are from six to eight feet high, and also several shoals. These obstacles seem to have been produced by the lava, which, in 1722, ran from the neighbouring volcano of Managua into the river, and it is supposed that they could be avoided by a canal cut through the level ground on the northern side of the Rio Tepitapa. There is even now a navigation between the town of Granada on the banks of the lake of Nicaragua and the port of S. Juan de Nicaragua, on the Atlantic. Flat-bottomed river-barges are used for the transport of goods, and accomplish their voyages in eight or ten days.

The most important river of Central America is the Rio [illegible], the channel by which the Golfo Dulce discharges its waters into the Gulf of Honduras, 15° 25′ N. lat. The Golfo Dulce is a fresh-water lake, about 50 miles in circuit. On its southern banks is the small town of Yzabal, which in some respects may be considered as the principal port of Central America, most of the European goods designed for that market being brought to it by vessels, and thence transported to the interior on mules. The Rio Dulce, issuing from the eastern portion of the lake, turns to the north, and expands into a small lake, called the Golfetta (the small gulf), about 10 miles in width. This river, which is about 20 miles long, has a considerable depth, except on its bar, where there are only six or seven feet water, so that large vessels cannot go up to Yzabal.

The Rio Polochic enters the Golfo Dulce from the west. This river rises on the table-land of Guatemala, but soon descending into a wide and deep valley, it becomes navigable at the Embarcadero de Teleman, a considerable distance from its mouth. It is a rapid river, and deep enough for vessels drawing several feet of water, but on the bar at its mouth there are only three or four feet of water. Still it is thought that if a road were made from Teleman to the town of Guatemala, the expense of the transport of goods would be considerably diminished.

The Motagua rises likewise on the table-land of Guatemala, close on its western border, and runs through it in an eastern direction, till it descends from it some distance W. of Zacapa. At Gualan, some miles farther down, the river becomes navigable, but, owing to its numerous rapids and shoals, it can only be navigated by boats not drawing more than 1 or 1½ foot water. Towards its mouth the river turns to the N.E. and falls into the Gulf of Honduras about 15 miles W. of Omoa. By means of this river a considerable quantity of European goods, especially the heavier kind, are sent into the interior of Guatemala; they are transported from Gualán to the places of consumption on mules.

East of the mouth of the Motagua several smaller rivers (the Chamalecon, the Ulua, the [illegible], the Lean, &c.) fall into the Gulf of Honduras, some of which are navigable for small boats for several miles. E. of Cape Camaron is the mouth of the Black River, or Rio Tinto, and still farther E. that of the Patook, both of which drain a considerable country; they run from W. to E. in the interior, where the Rio Tinto is called Rio Paon and the Patook Rio Guayape. The latter is navigable for a considerable distance, but the navigation does not extend to the mouth, the low country along the coast being occupied by Indian tribes, who have no intercourse with the inhabitants of the republic. The same observation applies to the Wanks, or Rio de Segovia, which empties itself into the sea near Cape Gracias á Dios, and to the River Blowfields, whose mouth is about a degree north of that of the S. Juan. Both are considerable rivers, draining large tracts, but this is all that we know about them.

The rivers which fall into the Pacific have all a short course. The largest is the Lempa, which is of considerable depth, and so rapid that it is entirely unfit for navigation. A bar at its mouth hinders even vessels of moderate size from entering it. The little river Michatoyat forms a small harbour at its mouth, which is considered as the port of the town of Guatemala, on the Pacific, and is called Barra de Istapa, or at present Puerto de Independencia. On the northern portion of the table-land of Guatemala runs the Usumasinta, a river of considerable length, which is not navigable within the boundary of Central America. It runs northwards, and enters the state of Tabasco, which belongs to the Mexican Union, where it is navigable and unites with the Rio Tabasco.

The lake of Peten, situated in the most northern district of Central America on the table-land of Yucatan, is of an oval form and about 70 miles in circuit. It contains several islands, on the largest of which is a small fortress, used as a prison. The lake of Atitan is 80 miles N.W. of the town of Guatemala, and near the western edge of the table-land. It is about [illegible] miles long and 9 broad, and remarkable for its extraordinary depth and for having no outlet, though several small rivers fall into it. In its neighbourhood is a volcano, which, in 1822, made a violent eruption. The lake of Guixar, N.W. of the town of S. Salvador, has a circuit of about 80 miles; it is said to communicate by a subterraneous channel with the much smaller lake of Metapa. The lake of Guixar is one of the principal feeders of the Rio Lempa. Along the low shores extending from Cape Camaron to the mouth of the Rio S. Juan there are many lagoons of considerable extent, which are separated from the sea by narrow and low strips of land. Some of them, as the Carataska lagoon, are above 10 miles wide and 3 or 4 times as long. They communicate by narrow outlets with the sea, but the water is not deep enough to admit small vessels. Most of them are imperfectly known.

The natural fountains, called geisers, have hitherto been supposed to exist only in Iceland, but Haefkins states, that there is a fountain of this kind on the table-land of Guatemala, not far from the town of Quezaltenango. A large mass of boiling-water is thrown up to the height of 20 or 30 feet.

The objects of agriculture differ considerably, according to the difference in the elevation of the soil. Wheat is grown almost exclusively in the most elevated districts of the table-land of Guatemala, and also in some districts in the hilly country. It does not seem to grow much below 5000 feet. In the same districts barley is cultivated, with potatoes and some of the European vegetables. The most common fruits are apples, pears, peaches, grapes [illegible]. Where the table-land does not rise much above 5000 [illegible] not [illegible] below 4000, in the neighbourhood of the town of Guatemala, there are extensive plantations of nopal trees for rearing the cochineal insect. Below 3000 feet, indigo, cotton, sugar, and tobacco are the chief crops, and on the low coast along the Pacific cacao is cultivated. The kinds of grain grown here most abundantly are rice and maize, but there are also large plantations of sesamum for obtaining oil, and of maguay, for the preparation of *pulque*, an inebriating drink. Maize is indeed grown all over the country. In the colder regions only one annual crop can be got; but in the warmer districts, where it yields from 150 to 300 return, two or three crops may be obtained, though the ears are smaller and the grain does not keep so well. Mandioca is not so much cultivated as the banana. The different leguminous vegetables, as beans, kidney-beans, *garbanzas*, or Spanish peas, lentils, &c., are to a certain extent spread over the whole country. Capsicum is extensively used instead of salt. The fruits of the warmer districts are merely pine-apples, yucas, sapotes, jocotes, anonas, oranges, &c. The agricultural products for exportation are indigo, cochineal, tobacco, cotton and sugar. Indigo is chiefly planted in the hilly country along the Pacific, between 80° and 90° W. long., in the state of Salvador. It is of excellent quality, and formerly 1,000,000 pounds were annually exported, but of late the continual civil wars have much reduced its cultivation. Cochineal is gathered in the neighbourhood of the town of Guatemala, and the quantity which some years ago was exported amounted to 100,000 lbs. Excellent tobacco is grown in the hilly districts, but no great quantity is exported, owing to the government having limited its cultivation to certain places and to a certain amount. The cotton grown along the Pacific is of excellent quality, but is always sent to foreign markets in an indifferent state, as the cultivators are not acquainted with the best methods of freeing it from the seed. Sugar is cultivated along the Pacific, but the quantity exported to Peru and Chile and sometimes to Mexico does not exceed 3000 or 4000 hundred weight. The cacao of Soconusco, the most western district on the Pacific, was a century and a half ago considered the best in the world, and reserved by the Spanish court for its own use. Other contiguous districts also produced and exported considerable quantities of this article; but, for some reasons not very well known, this branch of agriculture has decreased so much that cacao is imported from Guayaquil for the consumption of the country. Mahogany-wood, sarsaparilla, vanilla, and the black balsam, known under the name of Peruvian balsam, are also exported. Gold, silver, copper, and iron are found in several places in the hilly districts, and some mines are worked. Jasper and marble occur also. Brimstone of good quality is collected in the neighbourhood of certain volcanoes on the table-land, and salt is made along the Pacific, west of 90° W. long.

Cattle is abundant, particularly in the interior valleys of the hilly districts of Honduras, and along the north-eastern banks of the lake of Nicaragua. Hides and jerked beef, as well as live stock, are exported. The horses are small, but handsome and hardy. Sheep are only reared in considerable numbers on the table-land of Guatemala, where the wool, which is rather coarse, is used for the manufactures of Quezaltenango, &c. Hogs and poultry abound, and are of good size and quality. Mules are very numerous, their consumption in the country itself being very great, as they are generally used for the transport of goods. Among the wild animals are numerous tribes of parrots, mackaws, and monkeys. The quezal, one of the most beautiful of the feathery tribe, is only found in Central America. The manati is seen at the mouth of the S. Juan, where also, as well as in the lakes of Nicaragua and Managua, alligators are common.

The population of Central America consists of aboriginal tribes, of the descendants of Europeans, and of the mixed race or the offspring of Europeans and Indians. Several Indian tribes still live in a state of perfect independence, and nearly without any intercourse with the Europeans. These tribes occupy the whole of the eastern coast from the boundary of New Granada to Cape Camaron, and the country inland for 20, 50, and even 60 miles. Probably not less than one-eighth of the republic is in their possession. Some of these tribes, known by the name of Mosquito Indians, who occupy the coast from the mouth of the Patook river to Cape Gracias á Dios, and farther south, consider themselves placed under the protection of Great Britain. These tribes do not wander about, but derive their main subsistence from the cultivation of the ground. Other Indian tribes, who were subjected by the Spaniards, have now obtained all the rights of free citizens of the republic. These Indians are very numerous on the table-land of Guatemala, where they constitute the bulk of the [illegible] tion. They speak different languages, among [illegible] of the Quiché and Catchiquel are the most extended. Their principal occupation is agriculture, but some of them are also employed as workmen in the manufactures. In many parts they seem to enjoy a degree of comfort and to [illegible] easy circumstances; in others they are extremely [illegible] live miserably. The whites are the descendants of Spaniards, who have settled in this country since its conquest in 1524. They are dispersed over the whole of the country, but in none of the states do they form a majority, except in Costarica. The mixed race, in other parts of America known under the name of *Mulattos*, are called in Central America *Ladinos*. They are pretty numerous all over the country, but most so in the States of Salvador, Honduras, and Nicaragua. They are the most active portion of the population, and follow the different trades of shopkeepers, mechanics, muleteers, &c., and are frequently in easy circumstances. No recent census has been taken, but it is probable that the whole population is between 1,500,000 and 2,000,000, in which however the independent tribes are not included, their number being entirely unknown. It is supposed by Haefkins that the whites form one twelfth, the Ladinos four-twelfths, and the Indians seven-twelfths of the whole population.

The manufactures in Central America, though they have much decreased, are still important. Till the Spaniards lost their dominion in this country, nearly all the cotton and woollen goods consumed in it were made here. In 1795 there were more than 1000 looms for cotton goods in the town of Old Guatemala. This branch of industry has much decreased, owing to the free importation of English goods. The manufactures of woollen goods have not suffered to the same extent; the *chamarras*, a kind of black cloaks, are still made to a large amount at Quezaltenango and Totonicapán, where there are still some manufactures of coarse cotton goods, coarse woollen cloth, and common hats. It is conjectured that the annual value of the manufactured goods made in the northern districts of the table-land of Guatemala and exported to the other states, does not fall short of 200,000 Spanish dollars. There are manufactures of crockery, coarse furniture, and wooden utensils. In the town of Granada, in Nicaragua, four-post bedsteads of great beauty are made of the different kinds of wood peculiar to that country. They are not only sent to the other states, but also to the West Indies.

The United States of Central America are Guatemala, Salvador, Honduras, Nicaragua, and Costarica.

I. Guatemala comprehends the most northern portion of the republic, and the whole of the table-land of Guatemala, with the hilly country between it and the Gulf of Honduras, and the low tract which divides the table-land from the Pacific. The greatest part of the isthmus of Chiquimula also belongs to it. In this state all the cochineal, sarsaparilla, and vanilla are gathered, which are exported from Central America, and a great deal of mahogany is sent to Balize. In its most northern district, near the lake of Peten, there are still a few Indians in a state of independence. It is divided into seven departments, Verapaz and Peten, Chiquimula and Zacapa, Guatemala and Esquintla, Sacatepeques and Chimaltenango, Sololá and Suchetepeques, Quezaltenango and Soconusco, Totonicapán and Guegnetenango; and contains, besides the two capitals, New and Old Guatemala [GUATEMALA], the following places:—

Quezaltenango, on the table-land, not far from its western border, in a country nearly surrounded by volcanoes, contains a population of 14,000, mostly Indians, and the most considerable manufactures in wool and cotton.

Totonicapán, farther east, has 12,000 inhabitants, mostly Indians, and likewise manufactures in wool, wood, and crockery.

Cobán, near the eastern border of the table-land, in a very beautiful valley among groves of fruit-trees and plantations of bananas and su[illegible] contains 12,000 inhabitants, all Indians.

Gualán, a small town with about 2000 souls, is the place where the goods brought from the coast in barges up the river Motagua are to be unshipped to be transported on mules into the interior.

On the table-land several other places occur, whose population, consisting mostly of Indians, in many instances amounts to 6000, 8000, and even 12,000 souls. The low tract along the Pacific is very thinly inhabited, and still less so the hot and rainy valleys near the Golfo Dulce and the Gulf of Honduras.

There are two harbours in this state. Yzabal, on the Golfo Dulce, consists of about fifty or sixty huts, with 200 or 300 inhabitants, and is the depôt of the European merchandise. On the Pacific is the port of Independencia, at mouth of the river Michatoyat, inhabited by a few men. It is an open and unsafe roadstead.

II. Salvador extends along the Pacific from 88° to 90° W. long., and from 40 to 50 miles inland. It is the most populous part of Central America; even the shores of the sea, which are bordered only by a narrow, level, and low tract, are commonly well inhabited. Nearly all the indigo exported from Guatemala is grown here, besides sugar and cotton. The Peruvian balsam is collected in the forests. There are mines of iron. It is divided into four departments, S. Salvador, Sonsonate, S. Vicente, and S. Miguel, and contains several towns besides the federal district, with S. Salvador, the capital of the republic. [Salvador.]

S. Vicente, the capital of the state, contains about 8000 inhabitants. In its neighbourhood are extensive plantations of indigo, and near the village of Istepeque excellent tobacco is grown, which is known under that name all over Central America.

S. Miguel, farther east, has about 8000 inhabitants, and is noted for its fairs, of which the most important is held in November after the indigo crop.

Sonsonate, near the western extremity of the state, has a population of about 7000, and some commerce by means of the port of Acajutla, which exports sugar to Peru and Chile. The Indians inhabiting the country about the town make very beautiful mats, which are also exported. In the neighbourhood of Sonsonate is the Izalco, a very active volcano.

S. Anna, situated at a considerable elevation above the sea, has 10,000 inhabitants; in its neighbourhood are iron mines, which formerly afforded an annual produce of seventy-five tons, but at present hardly one-third of that amount.

This state has four harbours—Acajutla or Sonsonate, Libertad, Iiquilisco or Triumfo de los Libres, and Conchagua or Union. Except the last, which is on the west shore of the Bay of Conchagua, and is extensive and safe, these harbours are, properly speaking, only open roadsteads, hardly accessible during the rainy season and the prevalence of the S.W. winds.

III. Honduras comprehends the greater portion of the hilly region. On the S. it extends to the Bay of Conchagua, and along the Gulf of Honduras, from near the mouth of the Motagua to Cape Camaron. Politically, also, the whole country of the independent Indians, extending from Cape Camaron to Cape Gracias á Dios, and hence to the mouth of the Rio de S. Juan, is included in this state. It exports annually about 40,000 head of cattle to Guatemala. Its mines are the richest and best known in Central America. The most important are those of Mount Merendon, between Chiquimula and the coast, and of Oloncho and of Corpus, near the boundary of Nicaragua. The latter are worked by Englishmen, as well as those of Tabanco, near the boundary line of Salvador. Their annual produce is not known. Jasper, opals, and marble occur in some places. The population is concentrated in the interior valleys, the coasts on both seas being nearly uninhabited. This state is divided into seven departments, Comayagua, Tegucigalpa, Choluteca, Oloncho, Gracias, Yoro, and S. Barbara. In the interior are few considerable places, and on the coast the harbours of Omoa and Truxillo.

Comayagua (Valladolid de), the capital, is situated in a fine but unhealthy valley, at nearly an equal distance from the ports of Omoa and Truxillo, and contains 3000 inhabitants.

Tegucigalpa contains from 8000 to 10,000 souls, and has in its neighbourhood mines of gold, silver, copper, and iron. It is at a considerable elevation above the sea.

Omoa, on the Bay of Honduras, 15° 38′ N. lat. and 88° 5′ W. long., twelve or fifteen miles from the mouth of the river Motagua, is a small place but much frequented; the harbour, which is formed by a small bay, is very good. The goods imported from Europe or America are sent by barges to Gualan, on the banks of the Motagua.

Truxillo, farther to the E., is only a roadstead in an open bay, which formerly carried on an active trade with Havanna, but it now exports only mahogany and a few hides, with a small quantity of sarsaparilla and tortoiseshell to Balize.

IV. Nicaragua comprehends the most southern portion of the hilly region, about the sources of the rivers Wanks and Blewfields and the volcanic country which separates the lakes of Managua and Nicaragua from the Pacific, lying between the Bays of Conchagua and Nicoga, besides that portion of the plain of Nicaragua which is contiguous to the Rio de S. Juan. The plain is nearly uninhabited; the hilly region is thinly inhabited, but the volcanic country is comparatively populous. No part of Central America is well peopled except the volcanic districts, which form a long narrow tract, extending from the southern extremity of the lake of Nicaragua (10° 45′ N. lat.) to the towns of Quezaltenango and Totonicapán (15° 10′). Indigo, sugar, wood, and hides are exported from Nicaragua. Near the town of Nicaragua are the most extensive cacao plantations in Central America. Along the coast pearls are found, and in the Gulf of Nicoga the purple muscle, which is used in dyeing cotton yarn. In the most northern portion of this state are some mines of gold and silver, but they are not much worked. Nicaragua is politically divided into four departments,—Leon, Granada, Segovia, and Nicaragua.

Leon, the capital of Nicaragua, contained not many years ago a population of 32,000 inhabitants, but the civil contentions within the town have reduced it to half that number. It is situated on the road which leads from the best cultivated districts of the state to the harbour of Realejo.

Managua is a considerable place, containing 14,000 inhabitants.

Masaga has likewise a population of 14,000 souls, nearly all Indians, who are engaged in commerce with the adjacent populous country.

Granada, on the lake of Nicaragua, carries on some trade with Jamaica by means of the river and harbour of S. Juan. Population, 15,000 inhabitants.

Nicaragua contains, with the suburb S. George, 22,000 inhabitants, and is surrounded by a district noted for its fertility, especially in cacao and grapes.

On the coast of the Pacific are some good harbours, as Nicoya and Culebra. The harbour of Realejo, which is large and safe, exports the produce of the state to the other states, and to Peru and Chile; to which last-named countries mahogany, cedar wood, and Nicaragua wood are sent.

The harbour of S. Juan, at the mouth of the river of that name, is nearly uninhabited.

V. Costarica comprehends the western part of the high land which divides the plains of Panama from those of Nicaragua. It is only inhabited in its western districts; those bordering on the republic of New Granada are either uninhabited or in possession of independent Indians. Sugar, timber, and Indian corn are exported to Peru and Chile. Some mines of gold are worked. The most important are those of the mountains del Aguacate and at Real del Monte. Costarica is divided into two departments, Oriente and Occidente.

S. José, the capital, contains about 16,000 inhabitants.

Cartago, the former capital, has an equal population.

Acajutla is inhabited by 10,000 souls. This state contains two harbours. On the eastern coast of the Gulf of Nicoya is Punta de Arenas, in which vessels not drawing not more than nine or ten feet of water can enter. Matina on the Atlantic is a small and unsafe port.

The commerce of Guatemala is considerable, but it is difficult to form an estimate of it for want of exact information. Haefkins estimates the value of all goods imported at .000,000 Spanish dollars, and the exports at the same amount. He adds, that the exports were at least double that sum during the Spanish dominion. Thompson, on the other hand, thinks that the trade has considerably increased since the country has gained its independence. He states, that according to a rough account the English goods imported (in 1825, or shortly before), by way of Balize and Jamaica, amounted in value to 1,995,005*l.* sterling, and that goods to the amount of 2,500,000*l.* were returned to those two places. According to his opinion, the English goods, brought to Central America, formed about one half of the whole imports, and consequently all the goods imported into that country must have amounted to nearly 7,000,000*l.* sterling. The imports from Britain consist chiefly of broad cloth, cotton goods, hardware, and other dry goods. The Spanish and the French have the principal trade in silks, glass trinkets, wines, and spirits. Great quantity of crapes and other China goods are brought in American vessels to Acajutla.

The finances of Central America have deranged ever since the country obtained its independence, when the capitation tax on the Indians was abolished, and no taxes imposed to cover the deficit thus arising. The expenses in 1825 amounted to 652,608 Spanish dollars, but the revenues assigned to pay them produced only 471,359½ dollars, so that the remainder, amounting to 181,248½ dollars, was to be paid by the single states. The debt to England amounts to about 1,500,000*l.*, and there is another debt in the country itself, amounting to about 2,500,[illegible] Spanish dollars, which was contracted during the Spanish dominion.

In the late civil wars sometimes 8000 men were under arms; it is now stated that the regular troops consist of 1800 men, and that there are upwards of 20,000 militia.

The coast of Honduras was discovered by Columbus in 1502. When the Spaniards had conquered Mexico, and formed settlements on the isthmus of Panama, they began to enter Central America from the N. and S. They effected the subjugation of these countries between 1524 and 1536, but they were never able to conquer the Indians who inhabited the country from Cape Camaron to the mouth of the Rio S. Juan. During the wars which took place in South America before 1820, Central America remained quiet, and subject to Spain. The proceedings of the Spanish Cortes in 1820 gave rise to the declaration of independence on September 16, 1821. For a short time the country was united to the Mexican empire of Iturbide; but on July 2nd, 1823, the new constitution was published, according to which the federal government of Central America consists of a president, who is chosen every four years and invested with the executive power, and of a congress, composed of a senate and a house of representatives. Every state sends two members to the senate, and one member to the house of representatives for every 30,000 inhabitants. This constitution, though perhaps applicable to nations in other circumstances, seems not fit for Central America. Since its formation it has been the theatre of nearly continual civil wars, in which much blood has been shed. (Haefkins's *Centraal Amerika*; Thompson's *Official Visit to Guatemala*; Dunn's *Travels to Guatemala*; Humboldt; Iuarros's *History of Guatemala*; *Communications from* Col. Galindo.)

CENTRA'RCHUS, a genus of fishes of the section Acanthopterygii, family Percoïdes, and belonging to the subdivision 'with less than seven branchial rays.' In this genus the species have numerous spines in the anal fin: the tongue is furnished with a group of fine and very thickly set teeth; the pre-operculum is entire; the angle of the operculum is divided into two flat points; and the body is compressed and somewhat oval: they inhabit the rivers of North America. The genus Cychla of some American ichthyologists is synonymous with the above.

CENTRE, CENTER, from the Greek κέντρον (*kentron*), a sharp point. This word, by its successive introduction in one sense and another, has become a generic term for any point of a figure or solid body, such that the whole of the figure or body might be collected into that point, without any alteration in some respect or other which is specified. It is, in fact, an average point, as the following detail will show.

1. *Centre of Figure.*—If any number of points be situated in given positions with respect to a plane (A), their average perpendicular distance from the plane is common to all the points of a second plane (B), parallel to (A). If two other planes (A′) and (A″) be taken, and if (B′) and (B″) be planes distant from them by the average distances of the points, then (B), (B′), and (B″) will meet in a point which is obviously distant from the three planes by the several average distances of the points. And it is proved, by the application of algebra, that the point thus determined is also distant from any other plane whatsoever by the average distance of the points; whence it may be called the centre of *figure* of the points. It is usual to call it the centre of *gravity*, which it is on one particular supposition only, namely, that the points are supposed to have *equal* weights.

A solid figure cannot be supposed to be made up of points; but if it be divided into a number of equal elementary portions, and if one point be taken in each, and the centre of figure then found in the manner just described, the principles and processes of the integral calculus will determine the centre of figure of the portion of space within the limits of the solid. This, as before, is only the centre of gravity, on the supposition that the solid is of uniform density throughout.

The centre of figure may be made useful in finding the content of surfaces and solids formed by revolution, as follows:—

i. If an arc revolve round an axis the surface traced out is equal to a rectangle, one side of which is equal in length to the arc, and the other to the arc of a circle through which the centre of figure of the revolving arc passes.

ii. If an area revolve round an axis, the volume of the solid thus generated is equal to a cylinder or prism which has the area for its base, and the arc traced out by the centre of figure of the area for its altitude.

These propositions are the foundation of what has been called the *centro-baryc* method. [GULDINUS.]

2. *Centre of Gravity.*—This is the point at which the weight of the body being collected, the equilibrium of the body and of the system, if any, of which it forms a part, will not be disturbed.

3. *Centre of Gyration.*—This term, [illegible] almost peculiar to English mathematicians, and is now [illegible] has the following meaning: it is the point at which, if the whole of the matter in a body were collected, given forces would produce the same angular velocity of rotation in a given time as they would do if the particles of the body were distributed in their proper places. This centre is of course dependent upon the axis of rotation as well as the form, &c. of the body; every axis which can be chosen has its own centre of gyration.

4. *Centre of Percussion.*—That point of a revolving body which would strike an obstacle with the same force as if the whole of the matter were collected in it.

5. *Centre of Oscillation.*—The point in which the whole of the matter must be collected, in order that the time of oscillation may be the same as when it is distributed.

6. *Centre of Pressure.*—The point at which the whole amount of pressure may be applied with the same effect as it has when distributed. For methods of finding these several centres, see GRAVITY, &c., CENTRES OF.

In old writers, from the earliest periods, the term centre is used in the sense of a supposed centre of the universe, which it was imagined must coincide with the geometrical centre of the earth. And it was supposed to be a most obvious principle that all bodies must fall to this centre; which being a notion derived from the observation that all bodies fall towards the centre of the *earth*, was made an argument in favour of the stability of the latter. Even Copernicus has a notion of the existence of such a centre, or *medium mundi*, which, however, he places in the sun. It is hardly necessary now to say that there is no evidence whatever for the existence of any centre of the universe, that is, of any point which must necessarily remain fixed; but so well fixed was this notion in former times, that even if the earth were to be annihilated, it was supposed this centre would still exist with all its properties.

CENTRI'PETAL and CENTRI'FUGAL FORCES, forces which urge a body to *seek* (petere) or to *avoid* (fugere) a centre; in more modern language, attractive and repulsive forces. [ATTRACTION, REPULSION, FORCE, GRAVITATION, &c.]

We intend here to confine ourselves to the term *centrifugal force*, in one particular sense in which it is used in mechanics and astronomy, because it involves a point which is frequently mistaken. The term force, as used in mechanics, implies simply any cause of motion which is external to the matter moved; and the terms accelerating force, as well as retarding force, are used with reference to the velocities of bodies, and without reference to their masses or weights. So long as velocity remains unaltered, there is neither accelerating nor retarding force: when alteration of velocity begins, then we may say that force begins to act, for all we know of force is implied in the words 'cause of acceleration or retardation.' Again, owing to the convenience of words implying causation, it is usual to give the name *inertia* to that property of matter by which it maintains its state, either of rest or motion, unless acted on by other matter. And since the state of matter left to itself is either that of rest or of uniform motion in a straight line, every other species of motion, of what sort soever, is an effect of force from without: which assertion is verified in every instance in which it can be tried.

Suppose we fasten a string to an immoveable obstacle, such as a post, and pull it, say with a force of a hundredweight. It may not at first sight appear proper to say that the post also pulls the string, because we may not be able to conceive the latter acting, but only resisting. Nevertheless, the part which the post sustains, call it action or resistance, is still the equivalent of a force; for if it were removed, and another hand applied to the other end of the string, that hand must also push against the first with a force of a hundred-weight before the counteraction of the moving tendency of the first pressure is supplied. And in [illegible]lating the numerical effects of pressures, the equations of motion can take no cognizance of the cause of the pressures, but only of their amounts; whence it will arise that the effect, say of the resistance of an immoveable obstacle, must enter an equation in precisely the same manner as a physical attraction [ATTRACTION], a muscular effort, or any other mode of accelerating or retarding velocity.

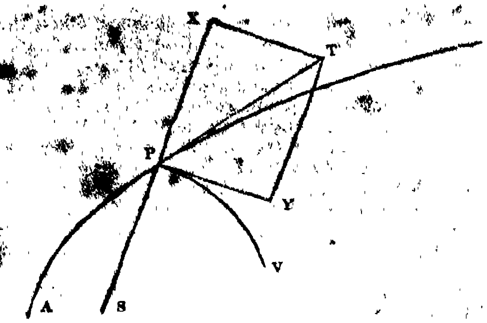
Now, it must be remembered that no alteration whatever of the effect of inertia can be produced without force of some kind. Let us now suppose a small bullet attached to a string, which string is fastened to a point upon a table, friction and the resistance of the air not being supposed to exist. Let the bullet be placed in a state of revolution round the fixed point, by means of the string, and with a given velocity. It will continue to revolve round with the same velocity, and the string will be stretched by a pressure depending upon the mass of the bullet and its velocity. The reason of the permanence of the velocity is contained in a proposition which is demonstrated in mechanics, namely, that forces applied to a material point in the direction perpendicular to that of its motion cannot change its velocity, but only its direction. If, for instance, a hand could apply pressure to a moving point on a table, by means of a string, so adroitly as always to keep the pressure perpendicular to the direction of motion for the time, the whole amount of the pressure might be varied so as to make the point describe any curve, but always with the same velocity as at the outset. Now, in the present case, the bullet must describe a circle, and the direction of the string, in which the retaining pressure acts, is always perpendicular to the tangent of the circle, being always a radius. This pressure of the string must be caused by an effort to escape on the part of the bullet, arising from its tendency to continue its motion in the direction of the tangent. This is the centrifugal force; and does not arise from any tendency which the body has to fly *from* the centre, but from this circumstance, that there is in the motion above described a constrained approach *to* the centre, or rather a constrained continuance at the same distance from the centre, such as would not exist in the motion of the bullet uninfluenced from without.

This centrifugal force is thus measured: suppose, for instance, the velocity of revolution in the circle to be 8 feet per second, and the radius 10 feet. Divide the square of the velocity by the radius, or divide 64 by 10, which gives 6·4. Then the pressure is such, that were it to take the place of the earth's attraction, the bullet, being allowed to fall, would, at the end of one second, have acquired a velocity of $6\frac{4}{10}$ feet per second, instead of $32\frac{1}{6}$, which is the case with bodies falling freely to the earth. And if we ask what weight must be hung to the string, so that it may receive the same pressure as when constraining a bullet of 2 pounds in weight to move at 8 feet per second in a circle of 10 feet radius, the answer is, such a proportion of the weight of the bullet as $6\frac{4}{10}$ is of $32\frac{1}{6}$,

$$\text{or } \frac{6\frac{4}{10}}{32\frac{1}{6}} \times 2 \text{ pounds, or on } \frac{384}{965} \text{ of a pound.}$$

If then this latter weight, hung at its end, would be the utmost the string would bear without breaking, then any accession of velocity in the preceding motion would also break the string.

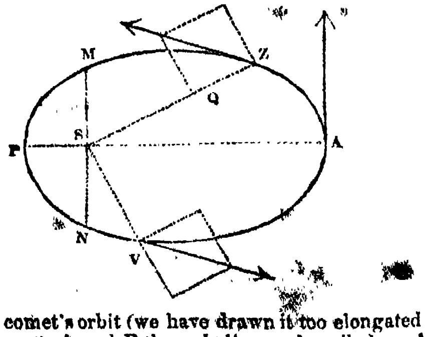
We now take the case of one of the planets moving in the curve A P about the sun at S, and attracted towards the sun, so that if reduced to rest for a moment at P, it would immediately begin to descend towards S. It must always appear to one not used to consider these subjects, that this attraction being perpetually exerted must at last make the planet fall into the sun. But suppose for a moment the attraction removed, so that the planet would pursue its course along P T. Prevent this by an inextensible string S P, in which case the planet will proceed in the circle P V, not with the whole velocity with which (but for the string) it would have proceeded along P T, but with a part, as follows:—Let P T be the length which would be described in a second, draw P Y perpendicular to S P, and complete the rectangle P X T Y. Then the velocity P T might be produced, if the string were not there, by an instantaneous communication of the two velocities P X and P Y in these directions. But when the string is supposed, the communication of such an impulse as would produce P X has no effect except an instantaneous tension of the string, which is supposed capable of resisting it. There remains only P Y, which would produce what has been before called the centrifugal force.



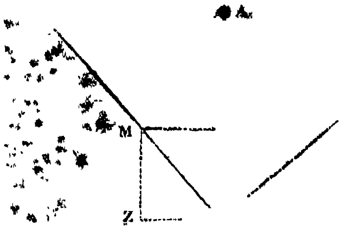
Now, if the string were not there, there remains the body P, with the same tendency to recede from the centre implied in its having the velocity P Y, and with the effect, which would be counteracted by the string, entirely uncounteracted. If then we look at the *paracentric* motion only, or the manner in which S P is lengthened or shortened, independently of the angular motion, we have, 1, the paracentric velocity P X actually existing; 2. the attraction of S in the direction P S; 3. the tendency to recede from the centre arising from the velocity P Y. The alteration of the first is not due to the second or third alone; if (2) exceeds (3) the velocity P X is diminished in the instant next following the body being at P; if (3) exceed (2) it is increased.

To realize the supposition above alluded to, namely, that the attractive force must bring the body P to the centre at last, we must put that force in a situation to act unopposed. Imagine a string which shortens as the body approaches the centre, so as always to remain stretched; and *also* suppose the attractive force to act, the effort to proceed in the tangent of the circle being destroyed by the string, and we have the case which is really supposed in the above mistake, for want of considering the centrifugal force.

The centrifugal force always (whatever the attraction may be) varies as the inverse *cube* of the distance, while the attractice force varies as the inverse square. Consequently if the revolution ever bring the body to 1-10th its primitive distance, the attraction is only 100 times as great as at first, while the effort to recede is 1000 times as great. Hence a very little knowledge of algebra will make it apparent that however much the external attraction may at first exceed the centrifugal force, there must come a point of approach to the centre at which the latter begins to exceed the former. And hence the alternate approach and recession of the planets to and from the sun. Let A Z M P N V be the ellipse of a comet's orbit (we have drawn it too elongated for that of a planet), A and P the aphelion and perihelion, A P the axis, and M N a perpendicular to it. Let the planet be projected at A with the necessary velocity: then from A to M the attraction exceeds the centrifugal force, and velocity towards the centre is created, as instanced by Z Q in the figure at Z. At M the attractive and centrifugal forces are equal; and from M to N the centrifugal exceeds the attractive, so that between M and P the velocity towards the centre is destroyed, and from P to N velocity *from* the centre is created. After N the attraction is again in excess, and between that and A the velocity from the centre is destroyed; after which the succession recommences.



Some readers may perhaps not find it easy to conceive how the centrifugal [illegible] should exist, when the pressure of the string, which it appears to counterpoise, is not present. On which we must observe that the string does not make this effort to recede, but destroys its effect. If it is clear that there must be a pressure on the string in the first illustration, it is because, under the circumstances, there is a force to cause that pressure already existing. There are numerous experiments in illustration of centrifugal force; take a tube, for example, and place a bullet inside it; let the tube be then put into a state of rotation round one end, and the bullet will be projected straight from it. The governor of a mill or steam-engine is an instance in which this effort to recede is made useful. But the largest scale on which the centrifugal force becomes visible is in the alteration of the time of oscillation of a pendulum in going from one part of the earth to another. Let A be the point of suspension of a pendulum P, and PM the line drawn through it perpendicular to the earth's axis, so that the angle APM is the latitude of the place. The motion of the earth carries the pendulum round in a circle of which PM is the continuation of the radius, so that there should be a slight action on the pendulum, such as should result from a pressure in the direction PM. Resolve this into PQ and PZ; the second will alter the position of equilibrium of the pendulum, the first will counteract a small part of the weight. The second will never be made visible; nor the first, except in comparing the number of oscillations of the same pendulum in different places. For the weight of the pendulum being differently lessened in different places, but the mass always remaining the same, the accelerating force is altered. For the law of the alteration, and the history of its discovery, see PENDULUM.



Among the various speculators on the cause of attraction we find those who have supposed both the phenomena of attraction and of centrifugal force to arise from causes external to the matter acted upon; and some have attempted to explain the former by an influx of particles to the sun, and the latter by an efflux from it. Thus one says, 'The acting power in the centrifugal force is the solar rays.' But what becomes of that effort which would cause the string to be stretched when a stone is whirled round at the end of a string, these speculators do not tell us.

CENTRISCUS (Linnæus), a genus of fishes of the section Acanthopterygii, and family Fistularidæ. The species of this genus are principally distinguished by their having a long tubular snout, from which character they have received the names of sea-snipes, trumpet-fish, &c. The body is inclining to an oblong oval form, compressed, carinated beneath, and covered with scales. The mouth is small, obliquely cleft, and devoid of teeth. There are two dorsal fins; the rays of the first (which is placed very far back) are spinous; the ventral fins are small, and situated behind the pectorals.

Centriscus Scólopax (Linnæus), the trumpet-fish or sea-snipe (known in Cornwall by the name of the bellows-fish), is the only species yet discovered off the British coast, where it is rare; the Mediterranean appears to be its natural locality. Its length is about five inches; the body is oval and compressed; the snout is elongated, and forms a tube which extends about an inch and a half before the eyes, which are large; the back is elevated, and the part for some little distance anterior to the first dorsal fin is straight, from whence it tapers rather suddenly to the tail. The anterior spine of the first dorsal (which has but three rays) is very large and denticulated beneath; the rays of the second dorsal are soft; the anal fin is elongated; the ventrals are small, and have a depression behind them, in which they may be lodged. The body is covered with hard rough scales, which are minutely ciliated on the external edge.

Young specimens of this fish are of a shining silver-like colour; the adult specimens are reddish, with the sides of the head and under parts silvery or slightly tinted with a golden hue.

There is a figure of this curious fish given in Yarrell's 'British Fishes,' and also in Donovan's 'British [illegible].'

The genus *Amphisile* of Klein is closely allied [illegible] and was included in the genus Centriscus by Linnæus; the species have the back mailed with larger scaly plates, of which the anterior spine of the first dorsal fin appears to be a continuation.

CENTRO'LOPHUS, a genus of fishes of the section Acanthopterygii, and family Sco[illegible]. Technical characters:—body elongate, covered with minute scales; teeth small and numerous; palatine without teeth; one very long dorsal fin.

Centrolophus morio, called the *Black Fish*, has been met with, though very rarely, on the British coast. It is of a black colour, the fins intensely so; the under parts are of a slightly paler hue. The head is rather [illegible] and rounded in front, and the mouth is small; the [illegible] are prominent; the body is compressed, and, in a specimen fifteen inches long, is about three inches deep. There is a thin elevated ridge on the back, to which the dorsal fin is attached; this fin commences before the middle of the back (viewing it from the side), and extends almost to the tail; the pectoral fins are pointed; the ventral fins are bound down by a membrane; the tail is large and forked; the body is covered with very small scales.

In Mr. Yarrell's 'British Fishes,' one specimen is [illegible]scribed as being fifteen inches long, and another 'measu[illegible] two feet eight inches in length, and weighed fourteen pounds. The skin was observed to be so tough as to be stripped from the fish like that of an eel: no air-bladder was found. The taste was delicious.' They were caught off the coast of Cornwall, and the species is described as having great strength and velocity.

CENTRONO'TUS (Lacep.), a genus of fishes of the section Acanthopterygii, and family Scombridæ. In this genus the spines, which in most of the Acanthopterygians form the anterior dorsal fin, are free or unconnected by membrane; they have all ventral fins.

The above characters are common to a large number of species of the Scombridæ, and hence it has been thought convenient to seize some minor distinctions for the purpose of dividing the genus Centronotus into several subgenera. In Cuvier's 'Règne Animal,' they are as follows: subgenus *Naucrates*, or those in which the body is elongate; the tail carinated at the sides, and which have two free spines before the anal fin. To this subgenus belongs the Pilot Fish (*Naucrates ductor*), which is well known for its habit of following vessels to a considerable distance in order to feed upon what is thrown overboard; and it is under such circumstances that this fish has been occasionally met with on the British coast. It is about a foot in length, and of a bluish grey colour, with five broad bands of deep violet. Its shape is something like that of the *mackerel*, but less tapering towards the head and tail. The pectoral and ventral fins are of moderate size, the latter very close together; the dorsal fin commences about midway between the head and the tail, and continues almost to the latter part; anterior to the dorsal fin there are three free spines: the tail is forked.

Subgen. *Elacates*. The species of this genus have nearly the form of the one last mentioned, but differ in the head being depressed, the tail not carinated, and there being no free spines before the anal fin. The next subgenus, *Lichia*, has free spines before the dorsal and anal fins, and the tail not carinated at the sides. In front of the dorsal spines there is a single one laid flat and pointing forwards. The Scomber amia of Linnæus, a large fish upwards of four feet in length, which inhabits the Mediterranean, belongs to this section. There are two other species known, from the same locality; the one here mentioned is distinguished by the lateral line being much curved and forming an S. The last subgenus, *Trachinotus*, differs chiefly from Lichia in having the profile of the body deeper, and the dorsal and anal fins longer and more tapered.

CENTROPO'MUS, a genus of fishes belonging to the section Acanthopterygii, division Thoracic-perches, and family Percoides. In this genus the muzzle is compressed, as in the pike, and the head, when viewed from the side, is much pointed; the lower jaw projects beyond the upper; the pre-operculum and operculum are covered with scales; the former is denticated, and the latter unarmed. There are two dorsal fins, with a distinct intervening space; the anterior one has eight, and the posterior eleven rays; the teeth are very minute and crowded; the ventral fins are under the pectorals.

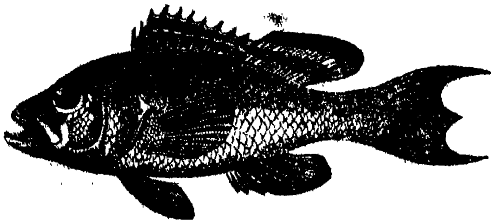
C. undecimalis, so named from its having eleven rays to the posterior dorsal fin, is common throughout South America, where it forms a considerable article of consumption and is known by the name of the 'sea-pike;' it frequents the mouths of great rivers, and sometimes extends its course up as far as the fresh water.

The sea-pike grows to a considerable size, and weighs sometimes as much as twenty-five pounds; the body is of rather a more elongated form than the common perch; its colour is greenish-brown above and silvery beneath; the anterior dorsal fin is grey; the other fins are yellowish, and finely dotted with black on the edges; the lateral line is black. This species is the only one of the genus known, and is the *Sciæna undecimalis* of Bloch.

CENTROPRISTES (Cuvier), a genus of fishes of the section Acanthopterygii, and family Percoïdes, and belonging to the division with seven branchial rays, and a single dorsal fin. This genus is distinguished chiefly by the species having all the teeth fine, rather strong and recurved, and closely set: the pre-operculum is serrated; and the operculum is spined.

Centropristes nigricans, one of the species known by the name of the black-perch or black-bass, is abundant in the rivers of the United States, and is much esteemed the table. It is of a deep olive-green colour above, and kish on the under parts; the dorsal fin is bluish, with pale transverse bands; the other fins are of a deeper hue; the tail and anal fins are spotted.

This species is remarkable for having the tail doubly notched, the central and two outer parts projecting. This character, however, is not so distinct in old individuals. The young are marked with clouded transverse bands.



[Centropristes nigricans.]

There are some few other species found on the American coast, the one above described is the *Perca varia* of Mitchell. (See the *Transactions of the Literary and Philosophical Society of New York.*)

CEOS. [Zea.]

CEPHAE'LIS, a South American genus of Cinchonaceous plants, remarkable among other things for their flowers growing in close heads, and being surrounded by involucrating bracts, which are sometimes richly coloured. They are chiefly interesting from comprehending the plant which yields the ipecacuanha root of the druggists. This, the Cephaelis Ipecacuanha, is a native of the forests of Brasil, growing in close damp shaded places, and flowering in the months of January and February; it was also met with by Humboldt and Bonpland in the mountains of New Granada. It is a perennial plant, with a weak stem not above two or three feet long, and usually lying almost prostrate. Its roots are contorted, from four to six inches long, about as thick as a goose-quill, and separating into rings which are about half as thick as the whole diameter of the root. The leaves collect about the end of the stem or its branches, are of an oblong ovate figure, slightly hairy, from three to four inches long, and connected by deeply-lobed fringe-like stipules. The flower-heads are very small, surrounded by green bracts, and placed upon the end of a long peduncle; when in flower they are said to be erect, but they are represented as being pendulous in that state as well as when in fruit. The flowers are small and white, and are succeeded by little purple berries. The Puri and Coroado Indians chiefly collect this drug, which furnishes them with a valuable means of barter with Europeans; they gather it at all seasons of the year, principally however in January, February, and March; and the only care they take is to separate the roots from the stem, to lay them up in bundles, and to dry them in the sun.

CEPHALANTHUS OCCIDENTA'LIS, or button-wood, is a North American plant, belonging to the natural order Cinchonaceæ, of which it is one of the most northern representatives. It derives its English name from the round balls of flowers with which it is covered in the month of August. This plant is common in swamps, ponds, and stagnant waters, from Carolina to Canada, forming a shrub from six to fifteen feet in height, with a light spongy wood. The inner bark of its root is an agreeable bitter, and is frequently used as a remedy in obstinate coughs, according to Elliot.

CEPHALO'CULUS, Lamarck's name for a genus of Branchiopoda, which he established for the *Polyphemus Oculus* of Müller, and which he places next to *Cyclops*. [Branchiopoda.]

CEPHALONI'A, the antient Cephallēnia (Κεφαλληνία), an island near the west coast of Greece, and the largest of the seven Ionian islands which form a state under the protection of Great Britain. The greatest length of the island, N.N.W. and S.S.E., is 31 miles; from Cape Viscardo, 38° 29′ N. lat., to Cape Scala, 38° 4′. Its breadth is very unequal, the island being indented by several gulfs, the principal of which, on the S.W. coast, called the Bay of Cephalonia, extends eight miles into the island, and forms a safe harbour. The breadth of the island about the middle is about ten miles; but in the N. part it is nearly double. Cape Scala is twenty-three miles W.N.W. of Cape Chiarenza, the nearest point of the coast of Morea, and eight miles N. by E. of Cape Skinari, the northernmost point of Zante. Cape Viscardo is five miles S. of Cape Dukato, the southernmost point of Santa Maura. Cephalonia is 24 miles from the nearest points of the coast of Ætolia and Acarnania, near the mouth of the Aspro Potamos and towards the entrance of the Gulf of Patras. The small island of Ithaca stretches alongside of the northern half of the E. coast of Cephalonia, being separated from it by a narrow channel from two to three miles wide. The area of Cephalonia is about 348 square miles, and the population in 1833 was 56,447; of whom 12,195 were agriculturists, 1771 manufacturers, and 815 were employed in trade. There were about 8000 acres sown with corn, 6242 planted with currants, 432 with olive trees, 12,232 with vines, 1000 with cotton and flax, and 1000 with pulse, besides 1644 acres of pasture, and 189,786 of uncultivated land. (*Official Returns of* 1833 *in the Tables of the Revenue, Population, &c. of the United Kingdom and its Colonies: Supplement to Part IV.*)

A calcareous ridge runs across the island from N.W. to S.E., and its lower projections cover nearly all the island, and jut into the sea in many places. The highest summit, called Oros Ainos, is about 4000 feet high, on which was a temple of Jupiter. There are no remains of the temple, and the mountain is covered with a forest. From the summit there is a splendid view over Acarnania, Ætolia, and as far as the mountains of Locris, embracing a great part of the gulf of Lepanto, and southwards to the mountains of Arcadia. The only plain in the island lies between Argostoli and Livato, in length about six miles, and is chiefly planted with vines, which give a fine delicate wine, though not fit for exportation. The chief produce of the island is currants, of which considerable quantities are yearly exported. It also produces oil and cotton. The other productions of the soil are oranges, lemons, figs, carobs, and an excellent sort of melons. In 1833 there were on the island 14,023 horned cattle, 26,323 sheep, 14,273 goats, and 3776 horses. The sea abounds with fish, and the mountains with wild pigeons and other game. The climate is very mild, but subject to storms and violent rains. Cephalonia is also subject to earthquakes.

As in antient times, the island is still divided into four cantons or districts, Argostoli, Lixuri, Livato, and Asso. Argostoli, the principal or capital town of the island, lies at the foot of a mountain on the W. shore of the bay of Cephalonia. It consists chiefly of one street and a market-place; the houses are low; it has a good harbour fit for ships of the largest size, a lazaretto, and about 5200 inhabitants. The immediate neighbourhood is marshy and unwholesome. The civil and criminal courts of the island sit at Argostoli. Opposite Argostoli, across the bay, is the town of Lixuri, which has a better appearance than the capital, is in a more wholesome situation, and has 5000 inhabitants. In the neighbourhood of Lixuri are some remains of the antient Pale, one of the four principal towns of old Cephalonia. The Catholic bishop resides at Lixuri. [illegible], at the north end of the gulf, has considerable trade. Asso, the antient Nisous, is an old fortress built by the Venetians on a peninsula in the north part of the island. There are besides several large villages, such as Tinea, St. Eufemia, Nauricata, Kalata, Zola, &c. The Cephalonians are said to be a spirited, intelligent, industrious, and persevering people, and to show the greatest aptitude for learning of all the natives of the Ionian islands. They have produced several distinguished men, and many of them have risen to rank in the Russian service, both military and naval. In most Turkish towns there are medical practitioners from Cephalonia. Under the Venetians there were frequent quarrels among rival families and factions in the island, with whom revenge was an hereditary feeling. Cephalonia has manufactures of cottons, and of carpets of mixed wool and goats' [illegible], called Zenie, which are exported chiefly to Italy. [illegible] also potteries, and distilleries for liqueurs. Many of the Cephalonians are employed as sailors. Others [illegible] summer to the Morea to assist in the harvest. [illegible] are common among them, and are at[illegible] salt-fish diet and the bad water they drink. [illegible] garrison, there is a native militia for the [illegible]. Under the Venetians the population [illegible] was calculated at about 50,000 (*Topo*[illegible] *eta*, 1787). The greater part of the population [illegible] church, and have their papas and caloyers, or [illegible] others are of the Latin church, and have a Roman Catholic bishop, and several convents of Franciscans. There are 11 free schools supported by the government, and attended by about 500 pupils, besides 78 private schools attended by 1200 boys.

ient times Cephalonia was known by various names. n the Odyssey calls it Samos. Its older inhabitants been a colony of Leleges. Same was also of its principal town on the east coast of the island, in ruins in Strabo's time (p. 455, &c). Thucy- 0) calls the island Tetrapolis, from its four towns s, Same, Palc, Cranii, and Proni. The Roman ulvius, at the close of the Ætolian war, 189 B.C., the four districts or tribes of the Cephallenians to submit to Rome, which they did, with the exception of Same, [illegible] strong-built town, which sustained four months' siege against the Romans, but was at last taken and destroyed, and the inhabitants were sold as slaves. Fulvius triumphed over both the Ætolians and Cephallenians, 187 B.C. (Livy, xxxix. 5.) Cephalonia remained subject to Rome until the division of the empire, after which it was subject to the Byzantine emperors till the twefth century, when the Franks dismembered the eastern empire. Cephalonia was then subject to the family of Tocco from Naples, who were despots or princes of Achaia. One of these princes gave it to the Venetians in 1224. It was invaded by the Turks in 1479, and retaken by the Venetians twenty years after, who retained it till the fall of the Republic in 1797, when the French took possession of it, but being driven away by the Russians in 1799, Cephalonia was made part of the new state of the Seven Islands under the pr[illegible] tion of Russia. By the peace of Tilsit in 1809, the French took possession of it again, but were soon after driven away by the English. For the present government of these islands see CORFU.

CEPHALO'PODA (Zoology), Μαλάκια (malakia) of Aristotle, *Mollia* of Pliny, *Cephalophora* of De Blainville, *Antliobrachio*[illegible]*ra* of Gray, a class of mollusks whose mantle, according to Cuvier, unites beneath the body, and thus forms a muscular sac which envelopes all the viscera. This body or trunk is fleshy and soft, varying in form, being either sub-spherical, sub-plano-elliptical, or elongato-cylindrical, and the sides of the mantle are in many of the species extended into fleshy fins. The head protrudes from the muscular sac, and is distinct from the body: it is gifted with all the usual senses, and the eyes in particular, which are either pedunculated or sessile, are large and well developed. The mouth is anterior and terminal, armed with a pair of horny or calcareous mandibles, which bear a strong resemblance to the bill of a parrot, acting vertically one upon the other. Its situation is the bottom of a subconical cavity formed by the base of the numerous fleshy tentacular appendages which surround it, and which have been termed arms by some naturalists and feet by others. [illegible] appendages in the great majority of living species [illegible] provided with *acetabula*, suckers or cupping-glass-like instruments, by means of which [illegible] to its prey or to foreign bodies. [illegible] suckers are either unarmed, or armed with [illegible] *onychoteuthis*. In the [illegible] for adhesion is so perfect [illegible] well observes in his Bridgewater [illegible] the muscular fibres continue contracted, it is [illegible] the substance of the limb than to release it from its attachment: and even in the dead animal the suckers retain a considerable power of adhesion.' The same author clearly describes the apparatus by means of which the *acetabulum* executes its functions. 'The circumference of the disk is raised by a soft and tumid margin [illegible] of long slender folds of membrane, covering corresponding fasciculi of muscular fibres, converge from the circumference towards the centre of the sucker, at a short distance from which they leave a circular aperture: this opens into a cavity which widens as it descends, and contains a cone of soft substance rising from the bottom of the cavity, like the piston of a syringe. When the sucker is applied to a surface, for the purpose of adhesion, the piston, having previously been raised, so as to fill the cavity, is retracted and a vacuum produced which may be still further increased by the retraction of the plicated central portion of the disk. Here we have an excellent description of the apparatus for 'holding on,' but the explanation stops short of showing how the operation of 'letting go' is effected. We well remember in our youth going far out with an old fisherman of Dawlish to visit his floating nets which he had laid for the pilchards. As we looked down into the clear blue water we could see that the number of fish entangled was great; but to the great discomfiture of the fisherman, who was eloquent on the occasion, almost every other fish was locked in the embraces of a cuttle-fish plying his parrot-like mandibles to some purpose. The fisherman, who seemed to regard these unbidden guests as an incarnation of all evil, carried a capacious landing-net, but so quick was the sight of these cephalopods, so ready were they in letting go and agile in darting back or sideways clear of the net, though the greedy creatures held on to the last moment, the fisherman did not secure above three out of the crowds that had spoiled his haul. Upon mentioning this to Mr. Owen, he informed us that the muscular arrangement enabled the animal, when it was disposed to let go its hold, to push forward the piston and thus in a moment destroy the vacuum which its retraction had produced. The same author has stated* that, in the calamary, the base of the piston is inclosed by a horny hoop, the outer and anterior margin of which is developed into a series of sharp-pointed curved teeth. These can be firmly pressed into the flesh of a struggling prey by the contraction of the surrounding transverse fibres, and can be withdrawn by the action of the retractile fibres of the piston. [TEUTHIDÆ.]

Digestive Organs.—The tongue, which is beset with horny points, lies between the mandibles, and the œsophagus widens into a kind of crop which leads to a gizzard nearly as fleshy as that of birds. To the gizzard succeeds a third stomach, which is membranous and somewhat spiral, wherein the liver, which is of considerable volume, pours the bile. The rectum opens into the infundibulum.

Respiratory Organs.—These are branchial, and the *branchiæ* are equal, symmetrical, and protected by the mantle under which they are concealed. The *infundibulum*, or funnel (*entonnoir* of the French), is a fleshy pipe or passage in front of the neck through which the respiratory currents pass and the excrements are discharged. The young, as in other classes, respire more quickly than the adult. Dr. Coldstream saw an *eledone*, one inch and a half in length, breathe eighteen times in a minute, while another of the same species, four inches in length, breathed only ten times in a minute.

Circulating Organs.—The higher organized Cephalopods present the remarkable circumstance of having three separate and well-organized hearts; one for the circulation of the arterial blood through the body, the other two for the propulsion of the venous blood through each gill or respi[illegible] organ. Only the first of these hearts, or the 'system[illegible] present in the Pearly Nautilus, which is, according to the type of the lower order of the class. In bot[illegible] the venous system is characterized by the gland[illegible] appended to the [illegible] of the vena cava [illegible] venous [illegible]

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* In the Cyclo[illegible]

Sexual Organs.—Separate and developed in distinct individuals. It is not determined whether impregnation is effected before the ova are excluded, during their exclusion, or afterwards. Owen leans to the opinion that it is effected by copulation, and [illegible] examination of the organs produces an [illegible] in favour of that opinion. Cuvier however says [illegible] there is reason for believing that the fecundation is effected [illegible] *arrosement*, as in the majority of fishes. The ovary of the female is situated in the bottom of the sac. Two oviducts receive the eggs from the ovary and carry them out across two large glands, which envelop them with a viscous substance and unite them together into bunches like grapes. The [illegible] of the male is situated much the same as the ovary [illegible] leads into a deferent canal which terminates in a fleshy penis placed on the left side of the vent.

Brain and Senses.—The brain is included in a cartilaginous cavity in the head, and gives off, on each side, a nervous cord which forms in each orbit a large ganglion, whence proceed innumerable optic nervous filaments. The eye is composed of numerous membranes, and covered by the skin, which becomes transparent in front of the organ, and sometimes forms folds which perform the office of eyelids. Owen has observed that the cornea of *Rossia* is defended by a circular fold of integument, which can be completely closed by an orbicular sphincter in front of the eye, a structure which is probably required in this species in order to protect the cornea against the spicula of ice, with which its native seas abound, especially in the summer or thawing season. In the calamary (*loligo*), on the other hand, there is no tegumentary fold. The ear is nothing more than a small cavity hollowed out on each side near the brain, without semicircular canals or an external tube, and in this cavity is suspended a membranous sac containing a limpid fluid and a small compact stony substance or otolithe, a sort of *ossiculum auditûs*.

Ink-bags.—This celebrated excretion is of a deep black, and, in those species which possess it (for it is not common to the whole family), is produced by a gland appropriated to its secretion and reserved in a small bag till the exigencies of the animal call for its effusion to cloud the surrounding water in order that it may conceal itself. It has been long considered that the celebrated Indian ink, imported from China, is manufactured from this secretion, but Cuvier observes that M. Rémusat has found nothing in the Chinese authors confirmatory of this opinion. That it makes an excellent pigment even after having been buried for thousands of years in the earth is proved by Dr. Buckland's fossil ink, which he submitted to a celebrated painter, who immediately inquired from what colourman such good sepia might be procured.

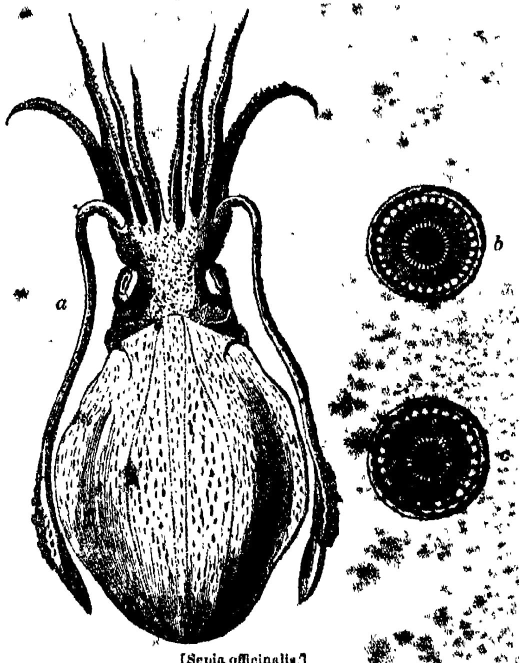
The skin of the naked species is changeable, showing spots which brighten and fade with a rapidity superior to the cuticular changes of the chamæleon. [CHAMÆLEONS.]

Food.—Principally fishes and crustaceans; but there is little doubt that few animal matters come amiss to these mollusks, for they are most voracious.

Geographical distribution.—Very wide. Hardly any sea is without some species of the family. Captain Ross discovered a new genus (*Rossia*, Owen), in the Arctic ocean. Fabricius describes two species which frequent the coasts of Greenland. (*Fauna Groenlandica*, p. 361.)

Utility.—The flesh, especially that of the arms, is eatable, and is considered very nutritious. Though neglected in the British islands, it is brought to table in other countries. The arms, cut into portions and prepared for cookery, are to be frequently seen in the Neapolitan market. The cuttle-bone is used for erasures and manufactured into 'pounce' of the shops. The prepared ink is capable of being made into a pigment. That the naked Cephalopods formed a favourite dish with the antients, and were considered not unworthy of the most exquisite cookery, there is no doubt. (See, for instance, Athenæus, *Deipnosoph.* lib. i. vi., vol. i., p. 14: lib. vii. lxxxvii. et cxxx., vol. iii., pp. 140 et 199: lib. xiv. xvii., vol. v., p. 25[illegible], Schweighaeuser's edition.)

The natural division of the class is into those Cephalopods which are naked (*Cephalopoda nuda*), and those which are protected by an external shell (*Cephalopoda testacea*). Of the former, *Sepia officinalis*, the common cuttle-fish, may be taken as an example; and the following cut will give a general idea of the form of a naked Cephalopod, but this varies in the different genera. In *Sepia officinalis* the soft parts are supported by a firm calcareous bone, the well-known cuttle-bone of the shops, and in all the naked Cephalopods (not including *Ocythoë*) now existing, it would appear that some rudiment at least of a bony, horny, or cartilaginous support is to be found. [SEPIADÆ.]



[Sepia officinalis.]

a, Sepia officinalis; the dotted line shows the place and shape of the dorsal piece or cuttle-bone; *b*, the lower side of an acetabulum of Octopus vulgaris; *c*, of an acetabulum of Eledone.

The *Nautilus Pompilius* affords an example of the testaceous Cephalopods, or those which are protected by a shell. [NAUTILIDÆ.] It may be expected that we should here say something of Argonauta; but with submission to the high authorities entertaining a different opinion, we do not think that the claims of the species of *Ocythoë* found in Argonaut shells, as fabricators of those shells, are sufficiently made out to warrant us in classing the cephalopods lodged therein as testaceous cephalopods. [BELLEROPHON; CAMERARIA; PAPER NAUTILUS; SEPIADÆ.]

FOSSIL CEPHALOPODA.

These are multitudinous, and, in the by-gone ages of the world, appear to have been powerful instruments for keeping down the other tribes of antient Testaceans, Crustaceans, and even fishes; for many of them—certain Orthoceratites and Ammonites for example—afford evidences of gigantic dimensions. In the periods prior to the chalk formation, and at the time of its deposit, they were the agents employed for this purpose, and were succeeded in the tertiary period by the fossil Trachelipods, which are either entirely absent or very scarce in the secondary and transition series, while the fossil Cephalopods occur but rarely in the tertiary beds. The extinct Ammonite [CORNU AMMONIS], Baculite, Belemnite, Hamite, Orthoceratite, Turrilite, and Scaphite, will readily occur to the fossil zoologist as some of the antient class, to say nothing of the hosts of small multilocular shells which D'Orbigny has so elaborately illustrated as cephalopodous under the denomination of *Foraminifera* (*Asiphonoidea* of De Haan), but whose cephalopodous structure the acuteness of De Blainville first doubted from the examination of one of the genus (*Miliola*), which he has declared to be without any relation to a cephalopod in its organization, and which the careful labours of M. Dujardin, in his examination of the genera *Miliola*, *Vorticialia*, *Rotalia*, *Truncatulina*, *Cristellaria*, *Melonia*, &c., in a living state, have proved to be animals infinitely lower in the scale of creation, and without any trace of cephalopodous organization. 'From these observations,' says Owen, in the excellent article above alluded to, 'it necessarily follows that the *Foraminifera* of M. D'Orbigny cannot be arranged with the cephalopods, or even placed in the molluscous series. M. Dujardin therefore proposes to consider them as a distinct class of *Invertebrata*, under the name of *Symplect*—

and until further and better evidence be adduced to the contrary, we shall regard these minute animals as having only, in the form and structure of their shells, a remote analogical relation to the cephalopods.'

SYSTEMATIC ARRANGEMENT.

Linnæus comprised all the Cephalopoda known to him under the genera *Nautilus*, *Argonauta*, and *Sepia*. Poli arranged them as *Mollusca brachiata*. Cuvier, who divides the mollusks into six classes, arranges them as the first class, under the name also of Cephalopoda, and commences by dividing the Linnæan genus Sepia into the *Poulpes* (Poulps) *Octopus* of Lamarck, *Polypus* of the antients; these he further subdivides into those which have their suckers (*acetabula*) arranged alternately in two rows running the whole length of the limb or arm, and the *Elédons* (*Eledone* of Aristotle), which have only one range of suckers running the whole length of the arm. He then proceeds to the genus *Argonauta*, and evidently leans strongly to the opinion that the Cephalopod usually found in the Argonaut shell is not a parasite, but the constructor of the shell. The fossil genus *Bellerophon* comes next in succession, the animal of which he considers to have been analogous to that of *Argonauta*. Then come the *Calmars*, Calamaries (*Loligo*, Lam.), and then the *Onychoteuthides* of Lichtenstein, *Onykia* of Lesueur. The *Sepiolæ* follow, to which succeed the *Sepiotheutes* of De Blainville (*Chondrosepia* of Leukard), and then the *Seiches proprement dites* (*Sepia* of Lamarck), the cuttles. Cuvier then proceeds to the genus *Nautilus* of Linnæus, which he subdivides into the *Spirules* (*Spirula* of Lamarck) and the *Nautili*, properly so called. Under these *Nautilidæ* he arranges the fossil genera *Lituus* of Breyn, the *Hortoles* (*Hortolus*) of Montfort, and the *Orthoceratites*. The *Belemnites** [BELEMNITE] come next, and of these no less than eighty-eight species have been discovered. The *Ammonites* [CORNU AMMONIS] follow, and lastly come the multilocular shells, *Les Camérines* of Bruguières, *Nummulites* of Lamarck, the *Foraminifères* of D'Orbigny [SYMPLECTOMEREA]. These last, for the reasons above given, are no longer to be placed with the Cephalopods.

Lamarck and Leach both adopt the name Cephalopoda, given to the class by Cuvier, and the former makes it the fourth order of his *Mollusca*, separating it into the following divisions:—

1st Division. Testaceous, polythalamous Cephalopods (*Immergés*). Shell multilocular, subinternal.
2nd Division. Testaceous, monothalamous Cephalopods (*Navigateurs*). Shell unilocular, entirely external.
3rd Division. Cephalopods not testaceous (*Sépiaires*)

1. *Polythalamous Cephalopods.*

These Lamarck defines as having a multilocular shell, partially or completely internal, and set in the posterior part of the body and he thus subdivides them:—

* Shell multilocular with simple septa.

The septa have simple borders, and are without notched and sinuous sutures on the internal wall of the shell.

1. Shell straight, or nearly straight; no spiral nucleus.

Orthocerata.

Genera. Belemnites.
Orthoceras.
Nodosaria.
Hippurites.
Conilites.

2. Shell partially spiral, but with the last whorl continued into a straight line.

Lituolea.

Genera. Spirula.
Spirolina.
Lituola.

3. Shell semi-discoïd; spire eccentric.

Cristacea.

Genera. Renulina.
Cristellaria.
Orbiculina.

4. Shell globular, spheroidal, or oval, with enveloping spiral whorls or chambers united tunically (loges réunies en tunique.)

Spherulea.

Genera. Miliola.
Gyrogona.
Melonia.

5. Shell discoïd, with a central spire and chambers radiating from the centre to the circumference.

Radiolea.

Genera. Rotalia.
Lenticulina.
Placentula.

6. Shell discoïd, with a central spire and chambers which do not extend from the centre to the circumference.

Nautilacea.

Genera. Discorbis.
Siderolites.
Polystomella.
Vorticialis.
Nummulites.
Nautilus.

** Shell multilocular, with septa notched or jagged on the borders.

Ammonea.

Genera. Ammonites.
Orbulites.
Ammonoceras.
Turrilites.
Baculites.

2. *Monothalamous Cephalopods.*

Shell unilocular, entirely external and enveloping the animal.

Genus. Argonauta.

3. *Sepiarian Cephalopods.*

No true shell, either internal or external. A solid, free, cretaceous or horny body contained in the interior of the greater part of these animals.

Genera. Octopus.
Loligopsis.
Loligo.
Sepia.

Such is Lamarck's arrangement, which is objectionable in many respects, especially in the Polythalamous division. To say nothing of the smaller multilocular shells, which, as we have already seen, more recent discoveries have removed from the Cephalopods, several of the genera are erroneous. Hippurites, for instance, belongs to the bivalves, and approaches very closely to the *Chamacea* [BIROSTRITES and SUBMYTILACEA], and Gyrogona has been [illegible] by Lyell to be a seed-vessel of a chara. De Blainville (1825) observes that it had become a general admission, since the remark of M. Leman, that the Gyrogonites found in the fresh-water formations were nothing more than the seeds of Chara.

Leach thus arranges the class:—

Cephalopoda.

Order 1. *Octopoda.*

Feet eight. Body finless.

Genera. Eledone.
Polypus.
Ocythoë.

Order 2. *Decapoda.*

Feet ten: the fourth pair much longer than the others. Body finned.

Family 1. Sepiolidea.
Genera. Sepiola.
Cranchia.
Family 2. Sepiidea.
Genera. Sepia.
Loligo.

De Blainville makes this class the first of his *Malacozoa*, and names the animals forming it *Cephalophora*, which he divides into the following orders and families:—

Order 1. Cryptodibranchiata.

Family 1. *Octocera.* Tentacular appendages eight in number, forming four pairs. Border of the suckers muscular. Body more or less globular, without any natatory expansion of the mantle, and without any dorsal protecting body. (Genus, *Octopus*.)

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* De Blainville, in his elaborate 'Memoir on the *Belemnitidæ*,' has given a list of ninety-one authors, from Theophrastus downwards, who have treated of these fossils. Count Munster has published a valuable paper on the subject. Dr. Buckland, in concurrence with M. Agassiz, proposes the name of *Belemnosepia* for the Cephalopod which secreted the fossil ink-bags; but this denomination comes very near to the *Belo-sepia* of Voltz. [BELOPTERA.

α. Species whose tentacula are very long, united at their base by a membrane, and furnished with a double row of suckers on their entire length. Example, *Octopus vulgaris*.

β. Species whose tentacula, agreeing in most other points with those of section α, are furnished with only a single row of suckers. (Genus, *Eledone* of Leach.)

γ. Species whose tentacula generally are shorter than those of the two first sections, and free at the base, and whose upper pair is bordered towards its extremity by a membrane. (Genus, *Ocythoë* of Rafinesque, the animals generally found in the shells of *Argonauta*.)

Family 2. *Decacera*. Tentacular appendages ten in number, consisting of five pairs, four of which are disposed much in the same way as those of the preceding family, though they are shorter, while the fifth pair, which is out of the rank, and between the mouth and the root of the third and fourth external pairs, is much longer, pedunculated, and furnished with suckers upon their enlarged and terminal portion only, which suckers are armed with horny processes on their border. Form of the body variable, but always provided with some lateral natatory expansion, and with a solid piece in the back. (*Calmar*, *Loligo*, Calamaries.)

α. Species whose body is globular and depressed. The superior border of the sac not distinct. Natatory appendages or fins circular, small, and as it were pedunculated, distant, and lateral. Dorsal-piece extremely slender. (Genus, *Sepiola*, Leach.)

β. Species whose body is more elongated, sacciform, and with the dorsal border of the sac not distinct. Fins or natatory appendages circular, still smaller than those of section α, pedunculated, and nearly touching each other at their origin on the back. Dorsal-piece not known. (Genus *Cranchia*, Leach*.)

γ. Species whose body is more elongated and subcylindrical. Fins large, triangular, terminal, lateral, and forming a triangle whose base is in front. Dorsal piece straight, and in form of a three-edged sword. Tentacular appendages rather long. Brachial appendages with very long peduncles, and armed with suckers, whose horny border is in the form of an elongated claw. (Genus *Onychoteuthis*, Lichtenstein.)

δ. Species whose body and fins are nearly of the same form with those of section γ, but whose dorsal-piece is flatter and generally wider before than it is behind, where it terminates in a small excavated point. Tentacular and brachial appendages generally shorter. Suckers furnished sometimes with teeth or hooks in a portion of their border, which is more or less considerable, but never with true claws. (Example, *Loligo sagitta*.)

ε. Species whose body, nearly of the same form as that of the last section, has its fins less terminal. They are triangular, but so disposed that the two when united form a rhomb. Border of the mantle free, very much prolonged into a point on the superior medial line, by the projection of the dorsal-piece, which is always narrower before and widened behind in the form of a feather. Tentacular and brachial appendages much the same as in section δ; but the suckers are less often furnished with hooks. (Genus *Pteroteuthis*, De Blainville.)

ζ. Species whose oval, depressed body is furnished with straight fins through the whole length of the body, as in the cuttle-fishes, but whose dorsal-piece is the same as in the feather-like calamaires, although broader. (Genus *Sepioteuthis*, De Blainville.)

De Blainville, who rejects the genera *Loligopsis*, Lam., and *Leachia*, Lesueur, concludes this order with the genus *Sepia*.

Order 2. Cellulacea.

This order contains the Foraminifères of D'Orbigny, and De Blainville guards himself at the very commencement from the supposition that he assigns the same situation to them as D'Orbigny. He observes, that it always seemed to him that it was by a forced analogy that the organized bodies that form this order were placed among the true polythalamous shells. The following are the families into which De Blainville divides them:—

Family 1. *Spherulacea* (Miliola, &c.)
2. *Planulacea* (Renulina, &c.)
3. *Nummulacea* (Nummulites, &c.)

Order 3. Polythalamacea.

Body contained in a lesser or greater proportion in the first (or rather the last) chamber of a polythalamous shell, or entirely inclosing it. Shell either straight, or more or less rolled up upon the same plane or superficies, divided into a considerable number of chambers, of which the first (or rather the last) is the largest, by septa, or partitions pierced by one or more siphons. De Blainville observes that this order is in truth established upon the incomplete knowledge then possessed as to the organization of the animal of *Nautilus* and *Spirula*, but that analogy shows an evident approach to them on the part of the *Belemnites*, the *Orthocerata*, the *Ammonites*, and some corresponding genera. It is not so, he adds, with *Hamites* and *Scaphites*, for we scarce know what they are. Since the 'Malacologie' was published, Mr. Owen has given to the world his anatomy of the *Nautilus Pompilius*, and the result of his anatomical researches into the structure of the other Cephalopods. We must return however to the system of De Blainville, who arranges the fossil shells which constitute this order according to the degree of incurvation or rolling up of the spiral cone.

Family 1. *Orthocerata*.

α. With simple septa.

Genera. Belemnites.

Shell conical, or a little compressed, straight, or hardly curved; hollowed at the base only into a conical cavity, wherein are piled, one over the other, simple concave septa, or partitions, pierced by a marginal siphon. This constitutes what is termed the alveolus. De Blainville divides the genus into many subdivisions, several of which have been separated into genera by Denys Montfort. Among them we may notice *Callirhoë*, applied by Péron and Lesueur to a genus of Ciliograda [CALLIRHOË], and generally adopted by naturalists, to the exclusion of Montfort's application of the term. See 'Malacologie' (1825), p. 376; and De Blainville's 'Memoir on Belemnites' (1827); Sowerby, 'Min. Con.,' vol. vi. p. 169, et seq.; and Dr. Buckland's 'Bridgewater Treatise,' p. 371. [BELEMNITE.] In De Blainville's arrangement the following genera succeed Belemnites:—

Conularia.
Conilites.
Orthoceras.

β. With sinuous septa.

Genus Baculites.

Family 2. *Lituacea*.

Shell polythalamous, or chambered, symmetrical, rolled up for a more or less portion of its extent, but always straight towards the terminal part, so that the opening is never modified by the penultimate whorl. Partitions or septa either simple or sinuous, and pierced by a siphon.

α. Septa simple.

Genera. Ichthyosarcolithes.
Lituola.
Spirula (including Hortolus of Denys de Montfort and Spirolina of Lamarck).

β. Sinuous septa.

Genera. Hamites.
Ammonoceratita.

Family 3. *Cristacea*.

Shell generally very much flattened; symmetrical, except perhaps at the summit, which is eccentric and spiriform. The last whorl nearly straight, much larger than the others, which are not numerous. Opening variable, but not modified. Septa or partitions always visible externally.

Genera. Crepidulina (a name too nearly approaching Crepidula [CALYPTRÆIDÆ]: the genus contains three genera, established by Denys de Montfort.)

Linthuris.

Family 4. *Ammonacea*.

Animal entirely unknown. Shell with the walls ex tremely delicate, partitioned, discoïd, and most generally compressed, not carinated, with a spire rolled or coiled up completely from the summit to the base in a vertical direction, and from behind forwards, so that all the coils or whorls are visible. The last whorl much larger than all the others, but modifying the opening very little. One or more siphons.

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* N.B. The dorsal-piece is altogether wanting in *Cranchia*.

Genera. Discorbites.
Scaphites.
Ammonites.
Simplegas (embracing four genera established by De Montfort.)

Family 5. *Nautilacea.*

Animal incompletely known from that of Nautilus. (But see NAUTILIDÆ, and Mr. Owen's clear and elaborate details of the whole organization of *Nautilus Pompilius.*)

Shell more or less discoïd, compressed, rolled or coiled up vertically and very symmetrically on the same plane. The last whorl much larger than the others, which it entirely hides. Opening large and oval. Septa united in the greatest number of cases, and pierced by one or two holes.

Genera. Orbulites (embracing two of De Montfort's genera).
Nautilus (embracing three of De Montfort's genera).
Polystomella (embracing six of De Montfort's genera).
Lenticulina (embracing eleven of De Montfort's genera).

Family 6. *Turbinacea.*

Animal unknown. Shell more or less turbinated, not symmetrical, rolled or coiled up in such a manner that one side forms a flattened base, and the other is more or less elevated. Opening not symmetrical, partitions simple and entire.

Genera. Cibicides.
Rotalites (embracing three of De Montfort's genera).

Family 7. *Turriculacea.*

Animal entirely unknown. Shell delicate, partitioned, leaving a cast composed of a great number of articulations, twisted or coiled into a tower-like spire, the whorls of which are clearly visible. Opening rounded, not modified. Siphon subcentral.

Genus Turrilites.

Such is De Blainville's arrangement.

Owen, who has so ably illustrated the anatomy and physiology of the class, makes the respiratory system the foundation of his arrangement. The following is the classification of the Cephalopoda proposed by him.

Order 1. Tetrabranchiata.

Most closely allied to the Gasteropodous mollusks. *Branchiæ* or gills four in number. Syn. *Polythalamacea* of De Blainville; *Siphonifera* of D'Orbigny; minus the *Spirulidæ* and *Belemnitidæ*.

Family 1. *Nautilidæ* (Nautilites).

Animal organized as described by Owen in his 'Memoirs on the Pearly Nautilus,' 4to. 8 plates, 1832. [NAUTILIDÆ.]

Shell external; spiral, or straight; septa smooth and simple; the last chamber the largest, and containing the animal: siphon central or marginal, and internal.

Genera. Nautilus (Lamarck).
Clymenes (Munster).
Campulites (Deshayes).
Lituites (Breyn).
Orthocerutites (Breyn).

Family 2. *Ammonitidæ* (Ammonites*, Snake-stones, Cornua Ammonis).

Animal unknown, presumed to resemble the Nautilus.

Shell external; spiral or straight; septa sinuous, and with lobated margins; the last chamber the largest, and lodging the animal: siphon central or marginal, and external. [CORNU AMMONIS, Zoology.]

Genera. Baculites (Lamarck).
Hamites (Parkinson).
Scaphites (Parkinson).
Ammonites (Bruguières).
Turrilites (Lamarck).

Order 2. Dibranchiata.

Approaching nearest to the Vertebrate animals. chiæ or gills two in number. Syn. *Cryptodibranchiata*, De Blainville; *Acetabulifera*, D'Orbigny; plus the *Spirulidæ* and *Belemnitidæ*.

Tribe Decapoda.

Family 1. *Spirulidæ.*

Animal corresponding in external form to the decapodous type; internal organization unknown; presumed to be dibranchiate.

Shell partly internal, cylindrical, multilocular, discoïd; the whorls separated; septa transverse, concave next the outlet, and with regular intervals. Siphon marginal and internal, uninterrupted.

Genus Spirula (Lamarck).

Family 2. *Belemnitidæ* (Belemnites, Thunder-stones).

Animal unknown. But 'as it is certain that the animals of this family of extinct Cephalopods possessed the ink-bag, they must consequently have been enveloped by a muscular mantle; and we may therefore infer that they resembled the dibranchiates in their locomotive and respiratory organs, and consequently in the general plan of their organization. In the structure and position of their siphoniferous camerated shell, they are intermediate to *Spirula* and *Sepia*, and as the animal of *Spirula* is proved to be a decapod, the probability is very strong that the animal of the Belemnite was of the same type.'

Shell internal, composed of an external calcareous sheath, formed by a succession of hollow cones, the exterior being the largest; of an internal horny sheath, also of a conical form, containing at its apex a chambered shell, the septa of which are concave externally, and perforated by a marginal and ventral siphon. [BELEMNITE.]

Genera. Belemnites (Lamarck).
Actinocomax (Miller).
Pseudobelus (De Blainville).

Family 3. *Sepiadæ* (Cuttle-fishes).

Animal, body oblong, depressed, with two narrow lateral fins extending its whole length.

Shell internal, lodged in a sac in the back part of the mantle, composed of an external calcareous apex or mucro (point), of a succession of calcareous laminæ, with intervening spaces filled with air, and supported by columns, but not perforated by a siphon, and an internal horny layer, corresponding to the anterior horny sheath of the Belemnites.

Genus Sepia (Cuvier).

Family 4. *Teuthidæ* (Calamaries, τευθος (teuthos), the term applied by Aristotle to the ten-armed Μαλακια (Malakia), with an internal horny plate or *gladius*).

Animal, body sometimes oblong and depressed, generally elongated and cylindrical; with a pair of fins varying in their relative size and position, but generally broad, shorter than the body, and terminal.

Shell internal, rudimental, in the form of a thin, straight, elongated, horny lamina; encysted in the substance of the dorsal aspect of the mantle.

Funnel with an internal valve, and articulated at its base to two ventro-lateral cartilaginous prominences of the mantle.

Genera. Sepioteuthis (De Blainville).
Loligo (Cuvier).
Onychoteuthis (Lichtenstein).
Rossia (Owen).
Sepiola (Leach).

β. Funnel unprovided with an internal valve, and adherent at the antero-lateral parts of its base to the mantle.

Genera. Loligopsis (Lamarck).
Cranchia (Leach).

Tribe Octopoda.

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* In the number of the London and Edinburgh Philosophical Magazine and Journal of Science for July, 1836, Dr. Rüppell has published some observations on the Fossil Genera Pseudammonites and Ichthyosiagonites of the Solenhofen Limestone, wherein, after referring to his paper published in 1829, he observes that one of these fossils (Aptychus, *Meyer*) is not unfrequently found within an Ammonite-like shell, but which has only an apparent likeness to the true Ammonite, for it has no internal septa. In many of those Ammonite-like shells there are found, near to their opening, two calcareous plates resembling in appearance a bivalve shell. These must, in Dr. Ruppell's opinion, have belonged to the animal which inhabited the Ammonite-like shell, and may, he states, have served as a kind of operculum to it, or perhaps as an organ for mastication; and, having observed a considerable number of these fossils, all of which confirmed the constant proportion of the diameters of the bivalve and Ammonite-like shell when found together, he remains confident that they belonged to one animal, forming quite a new type in the series of Mollusca, for which he has proposed the name of *Pseudammonites*.

Dibranchiate Octopods, besides wanting the long fasciculæ, are also characterised by the absence of mantle-fins, and consequently are limited to retrograde progression while swimming; their acetabula are sessile and unarmed; they have two oviducts, but without detached glands for secreting a nidamentum.

Family 1. *Testacea.*

Body oblong, rounded, mantle adhering posteriorly to the head; first or dorsal pairs of arms dilated, and membranous at the extremity. Funnel without a valve, but articulated at its base by two ball-and-socket joints to the inner side of the mantle. Branchial hearts, with fleshy appendages. No internal horny or testaceous rudiments; but an external monothalamous symmetrical shell, containing, but not attached to, the body of the animal; which also deposits its eggs in the cavity of the shell.

Genera. Argonauta (Linnæus). 'On the supposition that the shell is parasitically occupied by the Cephalopod, but formed by some other mollusk, some naturalists limit the above generic title to the shell*, and call the Cephalopod *Ocythoë*. We shall however continue to apply the term *Argonauta* to the Cephalopod in question, as the evidence, though strong, is not conclusive of its parasitic nature.' [PAPER NAUTILUS.]

Bellerophon (Montfort).

Family 2. *Nuda.*

Body generally rounded, mantle broadly continuous with the back of the head. Arms connected at the base by a broad web; first pair elongated, and gradually narrowing to a point. Funnel without an internal valve, or external joints; branchial hearts, without fleshy appendages; biliary ducts, without follicular appendages. Shell represented by two short rudimental styles, encysted in the dorso-lateral parts of the mantle.

Genera. Octopus (Leach).
Eledone (Leach).

The arrangement, definitions, and observations in the last-mentioned system are entirely Mr. Owen's, and they are founded upon an acute and accurate demonstration and observation of the organization of the class. And though we may, with all humility, differ from him in a few points, we consider the system, taken as a whole, by far the most satisfactory that has as yet been proposed.

Those who would study the natural history, anatomy, and physiology of the class, should consult the works of Aristotle, Pliny, Swammerdam, Needham, Baker, John Hunter, Monro, Scarpa, Tilesius, Cuvier, De Blainville, Home, Leach, Rathke, Bosc, Roget, Grant, Poli, Delle Chiaje, Rafinesque, Carus, San Giovanni, Coldstream, Mayer, Lesueur, Ranzani, Broderip, Quoy and Gaimard, Gray, Defrance, Montfort, Buckland, G. B. Sowerby, J. Sowerby, D'Orbigny, Ferussac, Dujardin, Owen, and, above all, the article 'Cephalopoda,' by the last-named author, in 'The Cyclopædia of Anatomy and Physiology,' where the latest and best information as to the organization of the class is to be found.

CEPHALO'PTERUS. [CORACINA.]

CEPHALO'TES. [CHEIROPTERA.]

CEPHEA. (Zoology.) [MEDUSA.]

CEPHEUS, a constellation, surrounded by Cassiopeia, Ursa Minor, Draco, and Cygnus, comes on the meridian at midnight in the middle of August, and at eight o'clock in the middle of October. A line drawn from the bright star in Cygnus to the Pole Star will be nearly bisected by α and η of this constellation. Cepheus, [illegible] King of Ethiopia, was the husband of Cassiopeia and the father of Andromeda, and was placed in the heavens, according to Hyginus, that no one of this remarkable family might be absent. He is represented in old plates as a man with a tiara on his head, kneeling on one knee, and with his arms extended.

	No. in Catalogue of		Magnitude.	Character, not in Bayer ().	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi (), Bradley [ ].	Astron. Society.			Flamsteed, Piazzi (), Bradley [ ]	Astron. Society	
	1	2399	6		30	2709	6
	2	2422	5		31	2707	6
	3	2465	4		32	2729	4
	5	2536	3	π	33	2768	5
		2539	6	γ	35	2826	3
β		2559	3		(220)	91	5
	9	2571	6	(χ)	(332)	2459	5
	10	2594	5	(K)	[2727]	2493	5
	11	2590	5	(h)	[2749]	2499	5
	17	2625	5	(e)	[3028]	2731	5
	21	2646	4½	(f)	[3054]	2757	5
	23	2659	4	(s)	[3125]	2802	5
	27	2691	4				

CEPHISUS. [ATTICA, and BŒOTIA.]

CEPHUS. (Ornithology.) [DIVERS.]

CEPHUS, a genus of Hymenopterous insects, of the family Xiphydriidæ (Leach). The characters are—antennæ rather long, growing gradually thicker towards the apex; head transverse, joined to the thorax by a distinct and rather long neck; mandibles exserted; maxillary palpi long and slender; body somewhat compressed, especially towards the apex; ovipositor distinct, exserted.

Cephus pygmæus is common in flowers, particularly buttercups; it is about one-third of an inch in length; black, with two yellow fasciæ on the abdomen; the palpi and tibiæ also more or less yellow. The larva of this insect is said to live in the stems of wheat. Mr. Stephen enumerates ten British species of this genus, most of which are black, with yellow fasciæ.

CEPO'LA (Linnæus), a genus of fishes of the section Acanthopterygii and family Tænioidei. The technical characters of this genus are:—Body much elongated, compressed and tapering gradually towards the tail, which is pointed; head (when viewed from the side) about the same width as the body; snout short and obtuse; under jaw curved upwards; teeth curved and well developed; dorsal fin extending from the head to the tail (which is pointed); anal fin extending from thence nearly the whole length of the body; branchiostegous membrane with six rays.

A species of this genus, which is found on the British coast, and likewise in the Mediterranean, is known in England by the names of the red band-fish and red snake-fish (*Cepola rubescens*). It is of a pale carmine colour, and varies from ten to fifteen inches in length: it is very smooth and almost destitute of scales: the body is slender, much compressed, and tapers very gradually from the head to the tail. The riband-like and compressed form of the body increases with age; the young are somewhat oval, or almost round. The pectoral fins are small; the ventrals are situated rather anterior to the line of the origin of the pectorals, and have the first ray spinous. The dorsal and anal fins both extend to and join the tail, or caudal fin (which terminates in a point), so that they form one continued fin. (Yarrell's *British Fishes*; Jenyn's *Manual of British Vertebrate Animals*; Linnæan *Transactions*, vol. vii., &c., where this fish was recorded as British for the first time by Col. Montagu.)

Cepola tænia (Linnæus) is said to differ from the species just described, in having a row of hard points along the side of the body, above the lateral line, and in having an inner row of teeth in the lower jaw; it is however very probably not a distinct species.

CERAM, an island in the Indian seas, between 3° and 4° S. lat., and 128° and 131° E. long., is, with the exception of Gilolo, the largest of the Molucca islands. Its length in a direction nearly E. and W. is 185 miles, and its average breadth about 30 miles; its area may be about 5550 square miles, but our maps do not enable us to ascertain it with any great accuracy. These dimensions include the peninsula of Hoewamochil, or Little Ceram, which is united to the main land at its western extremity by a narrow isthmus, called the Pass of Tamoeno. A chain of very high mountains runs through the island from E. to W.; the highest summit is about 7000 feet above the sea. A cluster of small islands off the east end of Ceram are called the Ceram Laut islands. The soil in the valleys of Ceram appears to be fertile. The peninsula of Hoewamochil formerly produced great quantities of cloves and nutmegs, but the trees were destroyed by the Dutch about 1657. The wood known in commerce as Amboyna wood is for the most part the produce of Ceram, which contains several large natural forests of the sago palm. The inhabitants of Ceram have been described by Dutch writers as people who have 'an unjust and cruel lust of blood and warfare, so that it would have been better if, instead of extirpating their trees alone, we had,' says Valentyn, 'at the same time extirpated this revengeful and sanguinary nation.'

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* We are of those who would continue such limitation.

It is probable that the disposition attributed to the natives of Ceram may have been called forth by the oppressions of the European settlers, and particularly by their destruction of the clove trees, which deprived the cultivators of the fruits of their industry and a profitable employment.

Ceram forms part of the government of Amboyna, a has followed the fate of that island as regards its different European possessors. [AMBOYNA.] The governor of Amboyna is accustomed to pay an annual visit to different parts of the coast of Ceram, accompanied by a numerous fleet of armed boats, containing native rajahs and other chiefs. The object of this voyage is, 'to examine into and decide upon all disputes that may arise among the Indians that are subject to the authority of the Europeans; to discover and prevent illicit trade, and to destroy such spice-trees as are found growing in places where they are not allowed.' (Stavorinus's *Voyages*; Hamilton's *East India Gazetteer.*)

CERA'MIUS, a genus of Hymenopterous insects of the section Diploptera, *Latreille*. This genus is arranged by Latreille next to the true wasps; it is readily distinguished by the superior wings being flat (not folded as in the wasps) and having only two cubital cells; the labial palpi are longer than the maxillæ. [VESPIDÆ.]

CERAMBY'CIDÆ, a family of Coleopterous insects of the section Longicornis, (Latreille). Distinguishing characters:—Body generally elongate; antennæ very long, as long or longer than the body; labrum very distinct and broader than long; maxillæ with the terminal processes membranaceous and projecting; mandibles moderate; eyes lunate, partly surrounding the basal joint of the antennæ; thorax nearly cylindrical, or orbicular, truncated before and behind; legs rather long, and generally compressed; tarsi spongy beneath, penultimate joint bilobed.

The Cerambycidæ are found in all parts of the globe, but they abound most in hot climates, and constitute a very extensive group of coleopterous insects, the most striking feature of which is the great length of the antennæ. One of their most important funtions appears to be to assist with numerous other wood-feeding insects, in the removal of old and decaying trees; it is in the larva state principally that this business is performed. The parent insect deposits her eggs in a hole excavated for the purpose: when these are hatched the larvæ commence feeding upon the wood, and in so doing excavate burrows in various directions, but mostly longitudinal; in this state they frequently live for two or three years*, and the perforations which they make are very extensive.

The larvæ are elongate, broadest towards the head, and taper slightly towards the tail, and are composed of thirteen segments. They have six legs (situate one on each side, on the under part of the three anterior segments of the abdomen) which are so minute as to be scarcely apparent. They move chiefly by means of the segments of the body, which have the upper and under surfaces flat and covered with minute tubercles. In making their way in the cylindrical, or, what is almost always the case, oval burrows, the animal protrudes these parts of the segments, above and beneath, and thus thrusts itself forward. The head has the appearance of being composed of two segments; the hinder part very broad (almost equalling that of the segment in which is inserted), terminated on each side anteriorly by an angle and separated from the forepart, which is narrow, by an elevated ridge; the jaws (*mandibles*) are short and very stout and strong; the antennæ are scarcely visible, the palpi are small. The first segment of the abdomen, or that next the head, is protected by a shield above, of a horn-like substance.

The pupæ are what is termed *incomplete*†, *i.e.* when the external organs (such as the wing-cases, antennæ, legs, &c.) are each inclosed in a separate and distinct sheath, and 'consequently not closely applied to the body, but have their form for the most part clearly distinguishable.' The antennæ, which have been before described as being very long in the perfect insect, are bent backwards and lie along the back of the pupa until they reach the apex of the body; they are then recurved and extended along the under side, and, if very long, they are again recurved, so that they, as well as all the other parts, lie close to the body‡.

The Cerambycidæ in the perfect state frequent especially of the Umbelliferous kind; the large spe often found on the trunks of trees. Different individuals of the same species vary extremely in size, a circumstance frequently observed in those insects whose larvæ feed on wood, arising most probably from the degree of moisture or ness of the food.

. Latreille restricts the genus Cerambyx to those species which have an unequal or rough thorax, usually spinous or tuberculated and dilated in the middle at the sides, with the third, fourth, and fifth joints of the antennæ evidently thicker than the following ones, and the remaining joints abruptly longer and thinner.

Cerambys heros affords an example of the genus: it is about an inch and a half in length; of an elongate form, attenuated posteriorly; black; elytra with the apex pitchy, or brown; the thorax is rough and shining, and has a spine on each side. This species, together with another belonging to the same genus (*C. cerdo*), has been found in England, but it is extremely rare; in the warm and temperate parts of Europe it is common. The larva perforates the oak, and according to Latreille is perhaps the cossus of the antients.

The genus Cerambyx of Mr. Stephens and most of the British entomologists is synonymous with that of Callichchroma of Latreille, whereas the characters given by him for Cerambyx agree with those of Hamaticherus of English authors.

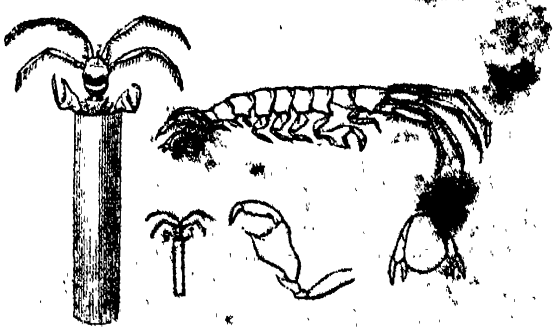
The Musk-beetle, which is very common in the south of England on old pollard willows, will serve to illustrate the genus Cerambyx of Stephens's 'Illustrations of British Entomology;' it is about an inch and a half in length, of an elongate and somewhat linear form; its colour is usually bright green, sometimes blue; the under part of the body is bluish.

This insect emits a very strong and agreeable odour, which is not unlike attar of roses. It certainly bears no resemblance to musk, though those who gave it the name of *Musk-beetle* appear to have thought that it did.

CERA'PTURUS. [PAUSUS.]

CE'RAPUS (Zoology), a genus of amphipodous crustaceans forming the sixth division of the third section of the order *Amphipoda* (Latreille), according to Desmarest. The following are the characters of this division: all four antennæ very great and strong, and nearly of the same length; the upper with four joints, the lower or lateral ones with five.

Say first established this genus, which has the antennæ hairy and performing in some sort the office of limbs, herein corresponding in a degree to the lower antennæ of the *Corophia* of Latreille. Feet of the first pair small, and terminated by a simple short nail; those of the second pair, on the contrary, very large, having a large, flat, triangular manus provided with a biarticulated thumb, corresponding to a well developed point which represents the immoveable finger in the ordinary crustaceans; those of the three succeeding pairs moderate and monodactylous, and the four last longer, more slender, and directed backwards and upwards. Body long, linear, demicylindrical, composed of twelve segments, the last of which is flattened into the form of an oval plate furnished on each side with a small bifurcated appendage at the extremity. Head terminated by a very small rostrum. Eyes projecting. Example, *Cerapus tubularis*. Like the larvæ of the Phryganeæ, this extraordinary crustacean, which is about six lines in length, lives in a small cylindrical tube, which is considered to be that of a Tubularia, exposing only the head, the four large an



[Cerapus tubularis.]

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* We have found Cerambyx larvæ, which, judging by the size of the insects to which they afterwards turned, were full-grown; these have been kept for upwards of a year without increasing in size in the slightest degree.

† See Kirby and Spence's 'Introduction to British Entomology.'

‡ The above definition of an incomplete pupa must only be taken in a comparative sense. The parts are in fact closely applied to the body, but not so much so as in the pupæ of the Lepidoptera.

t[illegible], and the two first pairs of feet. The species occurs in abundance in the sea near Egg Harbor, in the United States, in the midst of Sertulariæ, which are supposed to form its principal food. (See *Journal of the Academy, Nat[illegible]. of Philadelphia*, vol. i., p. 49, pl. 4.)

CERASIN, a peculiar gum, which exudes from cherry and plum-tree. The gum from the stem of Prunus Avium is stated to consist of

Cerasin . .	80
Gum . . .	20
	100

Externally cerasin resembles gum arabic, but its properties are different. When treated with water it leaves much undissolved mucilage, and its solution is not so viscid as that of gum arabic. It is not completely precipitated by alcohol, and the subacetate of lead occasions in 24 hours a precipitate in fine filaments. It is not coagulated by persulphate of iron, but this salt sometimes discovers the presence of gallic acid; it is not rendered turbid by solution of silicate of potash, nor by protonitrate of mercury, but with perchloride of tin it forms a stiff gelatinous coagulum. Neither cerasin nor gum arabic is precipitated from solution by infusion of galls. The above account is from Berzelius (*Traité de Chimie*, tom. v.). The more recent experiments of Guerin (*An. de Chim. et de Phys.* 49) assign somewhat different properties to cerasin; he states its specific gravity to be 1·475, that by boiling in water it is totally soluble, and the solution is precipitable by alcohol. The following is stated by Guerin as the composition of cherry-tree gum—

Water . . .	12·00
Ashes . . .	1·00
Arabin . .	52·10
Cerasin .	4·90
	100·00

CERASTES. [VIPERS.]

CE'RASUS, a genus of hardy trees, belonging to the Amygdaleous division of the natural order Rosaceæ, and including the common Cherry among its species. It is hardly different from Prunus, there being little or nothing to distinguish it beyond its leaves when young being folded flat, instead of being rolled up; botanists seem however pretty well agreed in looking upon the cherries as a genus distinct from plums, and we follow their example. The species may be divided into the True Cherries, the Bird-cherries, and the Cherry Laurels. What species are known in gardens will be briefly mentioned under each head.

Section I. True Cherries. *Flowers growing in umbels or singly, or occasionally in short corymbs; usually appearing earlier than the leaves.*

1. *C. avium*, the Wild Cherry. Flowers appearing with the leaves, which are pale and rather downy underneath. Branches when young weak and spreading. Fruit roundish [illegible] soft flesh and an austere juice. A native of the woods of Europe and the west of Asia; and in a cultivated form common in gardens; in this country it occurs as far to the north as Ross-shire, where it exists in the form of a dwarf bush propagating itself rapidly by the roots. The wood is remarkable for the large size of its medullary processes, which give its longitudinal section a bright satiny lustre, and render it well suited for ornamental cabinet In this respect it is much superior to the *C. vulgaris*. When growing in gravelly or sharp sandy situations with a [illegible]bottom, which are the only localities where it thrives, it [illegible]s a very considerable size, occasional specimens being spoken of as much as 80 feet and more in height; it is however more commonly seen in the state of coppice wood. To this species we presume all the weeping or weak-branched cultivated cherries with an acid juice are to be referred either as genuine varieties or hybrid forms; such are the Merise or Merisier, Morello, Kentish and All Saint or everflowering cherry, which last is often made into a species by systematic writers, and called *C. semperflorens*. Some of the varieties, especially the double-flowered French, as it is commonly called, the double Merisier of the French, are remarkable for their elegance and beauty. *C. avium* is the *Cerasus sylvestris* of Ray, and the *C. marasca*, or *marasche* cherry of Dalmatia, from which maraschino is prepared, has no specific marks to distinguish it.

2. *C. vulgaris*, the common cherry. Flowers appearing than the leaves, which are light green and smooth [illegible]neath. Branches when young stiff and erect. Fruit roundish or heartshaped, succulent, more or less firm, and sugary. Found wild in the woods of Asia Minor, where it acquires a very large size. Walsh speaks of it as being still common along the northern coast of Asia Minor, whence the 'original cherry' was brought to Europe. One variety is chiefly seen in gardens, the other grows in woods in the interior, particularly on the banks of the Sakari, the antient Sangarius. The trees attain a gigantic size; they are as[illegible]ded by perpendicular [illegible]ers suspended from the lowest branches. Walsh measured one of them 5 feet in circumference (?), 40 feet to the origin of the lowest branches, and from 90 to 100 feet in full height; this large tree was loaded with delicious, fine, transparent, amber-coloured fruit. Mr. Royle considers the cherry wild in Cashmere. It was introduced into Europe by the Romans under Lucullus, about half a century before the birth of Christ, and has ever since formed one of the most esteemed varieties of dessert fruit. It differs from the genuine form of *C. avium* in the characters above assigned to it, as also in its wood having such small medullary processes that nothing like a satiny appearance in it is produced, whatever the direction be in which it is cut; hence its grain is plain and it is but ill suited for cabinet-makers' work. It is to be presumed that this exotic species is the origin of the sweet large cherries called Bigarreaus, Guignes, and the like, to which must undoubtedly be added the Tartarian cherries of the English gardens. That the two species now enumerated were really distinct in the beginning we have little doubt; but long cultivation and their intermixture by hybridizing, either intentional or accidental, has so confused them that the gardens are filled with intermediate races, and their limits are lost sight of.

It is here that the *C. juliana* and *duracina* of modern botanists have to be referred; while their *C. caproniana*, or acid succulent cherries, are probably hybrids. [CHERRY.] For a full account of these species, see Loudon's *Arboretum Britannicum*.

3. *C. chamæcerasus*, the ground cherry. Flowers in umbels, either with the leaves or earlier. Leaves obovate-lanceolate, shining, crenated, quite smooth, with few or no glands. Fruit spherical, acid, with stalks longer than the leaves. A dwarf species, never rising above three or four feet high, and in the gardens usually budded on the common cherry at the height of five or six feet from the ground. It is not ornamental, and is seldom seen. Its native situations are stony, rocky, mountainous places, about the skirts of woods and in hedges in the eastern parts of Europe and west of Asia; it is common in Lower Austria and Hungary. Gmelin met with it in Siberia, and Ledebour, in the Kirghis desert, near Karkaraly, in the Altai.

4. *C. nigra*, the black American cherry. Flowers in sessile umbels, appearing before the leaves; light pink. Leaves obovate-oblong or obovate-lanceolate, often cuspidate, somewhat doubly serrated, with or without two glands at the base, slightly rugose. Segments of the calyx toothed. Native of the northern states of the North American Union, and extending into Canada and Newfoundland. It forms rather a handsome tree, with its loose umbels of pinkish flowers. The fruit is as large as a moderately sized cherry.

5. *C. Pennsylvanica*, Pennsylvanian cherry. Flowers in sessile umbels, appearing along with the leaves. Leaves ovate or oval, sharp-pointed, smooth, and rather shining, with minute unequal toothings. Segments of the calyx toothless. A native of the more northern parts of North America, especially in Canada, where it is common. It forms a small tree very like *C. nigra* in some respects, but differing from that species in its much smaller colourless flower and smooth rather shining leaves, which never acquire the obovate figure so common in *C. nigra*. The fruit is that of a bird-cherry, and is said to be sweet. *C. borealis* is considered by Sir William Hooker as being identical with this. It is represented in the southern states of the American Union by *C. umbellata*, which appears to differ chiefly in having spinous branches, more finely serrated leaves, and downy calyxes.

6. *C. serrulata*, fine-toothed cherry. Leaves oblong-lanceolate, obtuse at the base, tapering to the point, bordered with fine bristle-pointed teeth, thin, and not shining. A native of China, and only known in our gardens with double flowers. These are exceedingly delicate and beautiful, but they appear at so early a season as to be liable to injury from the spring frosts.

7. *C. pseudocera* [illegible] inese cherry. Flowers in hairy loose corymbs, [illegible] g before the leaves, with a long hairy tube to the caly[illegible] eaves ovate or obovate, cuspidate, doubly serrated, slightly downy on the veins. Chinese species, [illegible]ly from the northern provinces that great empire. [illegible] bears a sm[illegible] pale red sweet fruit which is more readily forced than that of the common cherry. It grows readily in the open air, forming a large bush, and producing its pale pink flowers in the beginning of March; on this account they are sometimes destroyed by frost. For some particulars concerning the cultivation of this species, see the *Transactions of [illegible] Horticultural Society*, vol. vii., p. 180, old series.

8. *C. depressa*, sand cherry. Flowers appearing a little earlier than the leaves, or about the same time, in small compact umbels. Leaves obovate-lanceolate, serrated, glaucous on the under side, bluish green and somewhat shining on the upper. Fruit mucronate. A small bush resembling a dwarf almond, covered with profusion of small white flowers in May, and afterwards with small, black, bitter, shining, sharp-pointed fruit. It is found in Canada and the northern of the United States, but appears to be unknown in our southern States. In our gardens it is a handsome bush, but short-lived. The nurserymen propagate it by budding on a plum-stock.

9. *C. prostrata*, the spreading cherry. Flowers solitary, or few in a cluster, appearing along with the leaves, than which they are shorter. Leaves roundish-ovate, loosely hairy beneath, deeply and simply serrated. Calyx-tube oblong, segments downy inside. A small prostrate bush, found on the sea-coast of Candia and on the mountains of Dalmatia and Asia Minor, where it enlivens the rocks with its gay pink blossoms late in the spring. In this country it is rare; it will live without protection in winter, but it prefers a moderate degree of shade, and is admirably suited for rockwork in sheltered places. Botanists are pretty generally of opinion that it is the same as what the Russians call *Amygdalus incana*, a species inhabiting the lower grounds of the Caucasian range; but in this we are persuaded they are wrong, for the *A. incana*, whether it be an almond or a cherry, forms a bush five or six feet high, and has narrow, oblong, blunt leaves, covered beneath with as close a down as those of *spiræa tomentosa*.

10. *C. Japonica*, the dwarf almond. Leaves ovate-lanceolate, very much tapering to the point, finely serrated, slightly downy beneath, very rugose. Flowers appearing a little before the leaves in small dense clusters. Calyx smooth, bell-shaped, with the segments as long as the tube. A native of Japan, and long known in our gardens as the double dwarf almond, one of the most beautiful objects that appear in the month of March. Its flowers in their double state are of a pale pink, with the delicate petals arranged with the most artificial symmetry, so as to resemble curious shell-work. Although quite hardy, yet this species should be trained to pales or walls, so as to be sheltered from the frosts that are so common at the early season when its flowers appear. The single-flowered plant has only been lately introduced, and is at present rare; the flowers are small, and not remarkable for their beauty. The fruit is a small, pale, red, acid cherry, not much larger than a pea.

Section II. Bird Cherries. *Flowers growing in long racemes, appearing with, or later than, the leaves. Leaves deciduous.*

11. *C. Mahaleb*, the perfumed cherry. Leaves roundish ovate, deciduous, glaucous on the underside, simply serrated. Flowers in somewhat corymbose racemes not much longer than the leaves. A shrub or small tree, remarkable the powerful and agreeable odour of its flowers. It is a [illegible]ive of rocks in the Tyrol, Dalmatia, Carniolia, and Hungary, spreading into Asia till it acquires its most eastern limits in the woods and hedges of the southern parts of the Crimea. It is not a particularly ornamental plant, and though perfectly hardy [illegible] seldom seen in our gardens. The fruit is black, and nauseously bitter.

12. *C. Pad*[illegible] the common bird cherry. Leaves oblong, cuspidate, rugose, simply serrated, deciduous. Flowers in racemes much longer than the leaves. A common species, wild in the woods and hedges of the middle parts of Europe, less common in the south, and occurring on the mountains of Caucasus and the Altai. It is readily known by its deciduous rugose leaves, long racemes of white flowers [illegible] round bitter fruit, which is however agreeable to birds. Two or three unimportant varieties occur in [illegible] dens; and also one with red fruit (*C. Padus rubra*). [illegible] ses of which are less rugose and more lucid, longer [illegible] ked; and not cuspidate. It looks like a hybrid between [illegible] *us* and *C. Virginiana.* This species is common in the [illegible] ies, and makes good underwood in plantations that are cut periodically.

13. *C. Virginiana*, the choke cherry. Leaves ovate or oblong-lanceolate, acuminate, serrated, flat, very smooth, shining, deciduous. Racemes long, cylindrical, lateral. In all systematic books are named two American bird cherries, *C. Virginiana* and *C. serotina*, to each of which are assigned characters that comprehend so little of a discriminative feature, that we find it impracticable to ascertain whether two species have really been before the writers on these subjects, or whether they have not distinguished, under different names, specimens of one and the same species. A suspicion of this kind has evidently come across the mind of more than one botanist, and it is highly probable that the whole of what is said respecting geographical distribution, uses, &c., is as applicable to the one as the other. As these particulars, at all events, refer to the common American bird cherry, a plant to which the preceding definition strictly applies, we have considered that to be what is meant by *C. Virginiana:* and we have applied the name of *C. serotina* to a plant which occurs in our gardens, and which probably is a different species, although closely allied to the present. Sir W. Hooker makes the following statement concerning *C. Virginiana.* This forms a large tree, according to Michaux, in the southern states, attaining from 80 to 100 feet in height. It is the Tawquoy-meen-ahtik of the Crees, according to Dr. Richardson, rising on the sandy plains of the Saskatchewan to 20 feet, but extending as far north as the Great Slave lake (lat. 62°), where it attains the height of five feet only. Its fruit is not very edible in a recent state, but when dried and bruised it forms an esteemed addition to pemmican. Elliott adds, that its timber is among the best in the United States for cabinet-makers' work. In this country it forms rather a graceful, though roundish headed tree, from 20 to 30 feet high; and its shining though deciduous leaves give it almost the appearance of an evergreen.

14. *C. serotina*, the late bird cherry. Leaves obovate-lanceolate, acute, serrated, channelled, very shining, deciduous. Racemes long, cylindrical, lateral. What is thus designated in this place is a plant with something of the aspect of a Portugal laurel, and as it flowers later than the last, its fruit is usually ripened in this climate. It is principally distinguished by its leaves being more obovate, never flat, but always half-folded up, and with a more shining surface.

15. *C. Capollim*, Mexican bird cherry. Leaves ovate-lanceolate, acuminate, serrated, flat, shining, deciduous. Racemes terminal. A native of the mountains of Mexico, and well distinguished by its taper-pointed leaves, and terminal racemes. It is not apparently distinct [illegible] the *C. salicifolia* of Peru. In this country it is rat[illegible]der, but forms a handsome object when trained t[illegible]lls or palings. Its bark is reputed a valuable febrifuge.

Section III. Laurel Cherries. *Flowers growing in long racemes, appearing with the leaves. Leaves evergreen.*

16. *C. Caroliniana*, the Carolina laurel che[illegible] Leaves oblong-lanceolate, acute, serrated, and entire, ever[illegible] Racemes lateral, much shorter than the leaves. [illegible] uncommon species in the collections of this country, t[illegible] climate of which it is not adapted. It is said to be one of the most ornamental [illegible] trees of Carolina, where it grows on islands and along [illegible] nks of rivers, from 30 to 50 feet high, with a regular oval head. Its leaves are very poisonous, 'and frequently in the spring of the year destr[illegible]tle that are tempted to browse freely on them.'

17. *C. lauro-cerasus*, the common or broad [illegible] laurel (cherry). Leaves oblong-lanceolate, remotely serrated, somewhat convex, pale green, evergreen. Racemes s[illegible]er than the leaves. This valuable and common evergreen, which now gives half their richness to the varied pleasure grounds of Great Britain; which is so hardy that no frost seems to affect it; which is equally capable of resisting the greatest heat and drought of summer, and which will flourish either in the most exposed or the most shaded situations, is a

[illegible] of the country near Trebizond in Asia Minor, and was sent from Constantinople to Ecluse, in the year 1576 by the imperial ambassador Ungnad. Ecluse gives an interesting account of the difficulty he had in establishing the first plant, which must have been transmitted as small charge, for it is stated to have been six feet h with a stem as thick as a man's arm. (Clusii, *Hist Plantarum*, p. 5.) A variegated and a barren leaved variety are known in gardens, but the original kind is the only one worth cultivating as an object of ornament. It is multiplied in the nurseries by layering, cuttings, and seeds. This species is remarkable for the abundance of hydrocyanic acid secreted in its leaves.

18. *C. Lusitanica*, the Portugal laurel (cherry). Leaves ovate-lanceolate, acuminate, concave, dark green, glandless, shining, evergreen. Racemes lateral, longer than the leaves. A native of Portugal, and also found in the Canaries, where it is called *Hixa*, acquiring a height of 60 or 70 feet. According to some the *Hixa* is a distinct species; Mr. Barker Webb found that plant on the Serra de Gerez in Portugal, of the height just stated, while the true *Cerasus Lusitanica* was not above 18 or 20 feet high. This is less hardy than the preceding; it is less easy to transplant, and will not grow so well under other trees: nevertheless, it is one of the most useful of our naturalized evergreens. It produces fruit in abundance in England, from which it is readily propagated.

CERATES, the name given to certain combinations of wax with other substances, which are used as external applications in the treatment of various surgical cases. They are of a degree of consistence intermediate between that of plasters and that of ointments; and, according to the nature of the materials united with the wax, are capable of serving different ends. They may be emollient, when applied to inflamed or chapped surfaces, or stimulating, when applied to indolent ulcers; and in the case of wounds or abraded skin are useful in excluding the air, and preventing the dressings from adhering.

CERA'TINA, a genus of Hymenopterous insects of the section *Mellifera* and family *Apidæ*. Technical characters:—exterior palpi six-jointed, interior two-jointed; antennæ inserted in a little fossula, and terminated almost in an elongated club; mandibles sulcated, and tridentate at the apex; abdomen somewhat ovate, elongate, narrower towards the base, and destitute of a ventral scopa.

This genus is included in the section Apis (xx *d.* 2 *a.*) of Kirby's 'Monographia Apum Angliæ.'

Ceratina cærulæa (Apis cyanea, *Kir.*), a little bee which is very uncommon in this country and found during the autumn in the flowers of the Jacobææ, will serve as an illustration of this genus:—it is about a quarter of an inch in length, of a bluish-green colour, and very smooth and shining; the fore part of the head in the male is white.

There is a long and interesting account of the habits of this little insect given by Spinola in the tenth volume of the 'Annales du Muséum d'Histoire Naturelle,' from which the following facts are drawn.

The female Ceratina selects the dead branches of the bramble and likewise those of the sweet briar, and with her mandibles excavates the pith, until a cylindrical burrow of considerable length is formed; this is then divided, generally, into eight or nine cells, by partitions formed of the pith which was dislodged, mixed with a glutinous secretion. In each [illegible] it is formed, an egg is deposited: it is then furnished [illegible] portion of honey, which serves for the food of the larva [illegible] closed.

[illegible] account is given under the name of *Ceratina albila-* [illegible] which is said to be synonymous with the one above-mentioned. Spinola states that the insect is common in the south of Europe.

CERATO'NIA SILIQUA, St. John's Bread, or the carob-tree, is a remarkable plant, found wild in all the count[illegible]rting the Mediterranean, especially in the Levant. [illegible]alta it is almost the only tree that grows, relievi[illegible]e irksomeness of the white stone enclosures by its dar[illegible] It belongs to the natural order Leguminosæ, [illegible] which it is singular for the very unusual circumstan[illegible] of its flowers having no petals. The pods contain a sweet nutritious pul[illegible]d are sometimes seen in the fruiterers' shops in London: they are a common article of food in the countries where the tree grows wild. Pliny calls it *Siliqua prædulcis*. At the present day it is sent from Palestine to Alexandria in ship-loads, and from thence across the Mediterranean, and as far as Constantinople, where it is sold in all the shops. The pulp resembles manna in taste and consistence, and is sometimes used as sugar to [illegible]serve other subs[illegible]. But th[illegible]mstance that has [illegible]ndered it famous [illegible] controv[illegible]er it was not the [illegible]l food of St. John [illegible] wilder[illegible]ome of the fathers assert that the *ἀκρίδες*, or l[illegible]f St. John were some [illegible]etable substance; and the [illegible]*ριον*, wild honey, the saccharine matter of this pod. It is certain that the [illegible]nt grows in great abundance in the wilderness of Palestine, where its produce is at this day used for food. It is called by the Arabs kharoob.' (Walsh.) The Spaniards call it *algaroba*, and give its pods to horses. The seeds, which are nearly of the weight of a carat, have been thought to have been the origin of that ancient money-weight.

[Ceratonia Siliqua.]

CERATO'PHRIS. [FROGS.]

CERATOPHY'LLEÆ, a small and obscure group of plants, comprehending the single genus Ceratophyllum, and probably a mere section of Urticaceæ, with the structure and habit of that natural order modified by the submersed situation in which the species live. They are aquatic plants, with cellular leaves split into capillary divisions, with monœcious flowers, a many-parted inferior calyx, several stamens, a one-celled ovary with a pendulous ovule, and a seed whose embryo has four cotyledons surrounding a highly developed many-leaved plumula. *Ceratophyllum submersum* and *demersum* inhabit ditches in this country.

CERATO'PHYTA. [CORALLIA.]

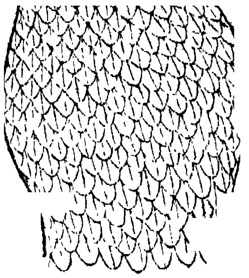
CERBERA, a genus of Apocynaceous plants, containing, among other poisonous species, that from which the tanghin poison of Madagascar is procured. The genus Cerbera is known in its order by the calyx being leafy, the corolla funnel-shaped, with a clavate tube, and five scales on its orifice, the stamens sessile just below the orifice of the tube, and a one or two-seeded drupe, with a fibrous woody stone. The tanghin tree, *Cerbera tanghin*, is described as a tree with lanceolate alternate leaves, of a leathery texture, pale pink flowers arranged in corymbose panicles, with a crimson star-like blotch at the orifice of the tube, and an oval drupe as large as a peach, of a green colour, stained with purple, and not unlike some sorts of mango. The following interesting account of the plant is given by Mr. Telfair:—The kernel of the fruit must be a very powerful poison: it is not much larger than an almond, and yet is sufficient to destroy above twenty persons. Radama, the late king of Madagascar, abolished the use of it as an ordeal; whether the custom has been revived by the new government I know not. It was with great difficulty that the chieftains could be persuaded to admit of the abolition of an usage, which had existed from time immemorial, and whose unerring efficacy in the detection and punishment of crime had never been questioned, until Mr. Hasty our government agent had acquired such an influence with Radama and his court as to admit of the exposure of [illegible] fallacy. But this was the work of years; and although Radama was at length himself convinced that nothing could be more unjust than the continuance of the practice, he dared not so far shock the prejudices of his people as in order that it should cease. Even the chief performers in the ceremony, the Skids, as they are called at Tanarariseo, who unite in their own persons the offices of priests and physicians, and who administer the poisonous kernel to the victims, never doubt its power of revealing guilt or clearing innocence; the last occasion on which it was practised in Radama's reign, and of which he availed himself to effect its discontinuance, personally regarded his court and attendants. The king was affected with a complaint of the liver for which the skid prescribed some inefficacious remedies, and as the disease became worse, Mr. Hasty gave him some calomel in doses, which he had found by experience to relieve himself under similar symptoms. The disease disappeared, but ptyalism was produced, and alarmed the king's family, who believed that he was poisoned, and insisted that all his immediate attendants should be put to the ordeal of the tanghin, and the royal skid was most earnest in pressing to have it performed, although he himself, from his rank and place, was among the first to whom it would be administered. In vain the king protested that he felt himself cured, and that the indisposition and soreness of the mouth was caused by the medicines that had relieved him, and which would pass off in a few days. The skid insisted, the ministers and principal chieftains joined with the family in requiring the ordeal, to which the king, in spite of his convictions, was compelled to consent; but at the same time he made it a condition that this should be the last exhibition of the kind, and he bewailed the necessity which deprived him of so many attached dependants, whose fate he had predicted, while he protested his conviction of their innocence.

The king's servants, including the skid, were more than twenty in number; they were shut up at night separately and not allowed to taste food; the next morning they were brought out in procession, and paraded before the assembled people; the presiding skid had the tanghin fruit in readiness; after some prayers and superstitious evolutions he took out the kernel, which he placed on a smooth stone and with another stone broke down part of it into a soft white mass like powdered almonds. The victims were then brought separately forward, each was questioned as to his guilt, and if he denied, his arms were tied behind, and he was placed on his knees before the skid, who put a portion of the pounded kernel on his tongue and compelled him to swallow it. Thus the kernel was shared among all the king's personal servants. On some of the individuals the poison began to operate in half an hour or less. The skid takes particular notice how they fall, whether on the face, to the right or left hand, or on the back, each position indicating a different shade of guilt. Convulsions generally come on, accompanied with efforts to vomit. Those whose stomachs reject the dose at an early period usually recover: on this occasion there were only two individuals with whom this was the case; the others were thrown in a state of insensibility into a hole, and every person present at the ceremony was obliged to throw a stone over them, so that their burial was quickly completed. The king's skid was one of the first that fell. Those that recover are supposed to bear a charmed life ever after, and are respected as the peculiar favourites of the gods.

CE'RBERUS, the watch-dog of the infernal regions, the offspring of Typhon and Echidna. According to Hesiod he had fifty heads; according to Horace, 100; the ordinary account gives him only three, and this number, which corresponds to the triple form in which Geryon and Hecate appear, points to the usual phenomenon in the elementary worships of antient Greece, in which a power of the nether world was also a terrestrial and celestial divinity. The Chimæra was another monster of the same kind. Cerberus was also the name of a serpent which infested the neighbourhood of Cape Tænarus. The word probably signifies 'dark;' Cerberian occurs as a synonym for Cimmerian in Hesychius. Nicander applies it as an epithet to a toad. (Dahler, ex. voc. [illegible] in.; Steph. *Thes.* ed. Lond. vol. i. [illegible]xxxii.)

CE'RBE[illegible] (Zoology), a subgenus of Ophidians (serpents), established by Cuvier in his division of the great genus *Coluber*. The *Cerberi*, like the *Pythons*, next to which are placed in the 'Règne Animal,' have nearly the whole of the head covered with small scales, and plates only [illegible] before the eyes; but they are without the [illegible] near the vent. Cuvier further says that they have also sometimes simple plates at the base of the tail, but observes that whilst he has seen this arrangement in one individual, he has remarked others of the same species which had them all double; a proof, in his opinion, of the small importance of the character. Example, *Kuroo Bokadam*. (*Coluber Cerberus* of D[illegible] Russell, who gives the native name above stated, thus describes the species.

'Abdominal scuta 144, subcaudal squamæ 59. The head, somewhat broader than the neck, yet appears small in proportion to the trunk; a little convex above, compressed on the sides, and projecting into a short, obtuse, or subtruncate snout, on which the eyes and nostrils are situated. The snout is covered with small laminæ of various forms; the rest of the head with small suborbicular carinated scales. The mouth not large, the jaws nearly of equal length. The teeth close set, regular, small, reflex; a marginal and two palatal rows in the upper jaw. The eyes vertical, small, orbicular, protuberant, each situated in the centre of a remarkable circle of small triangular laminæ. The nostrils very small, vertical, near to each other, and close to the apex of the rostrum.



[Head of Cerberus.]

'The trunk thick, round, covered with large carinated, broad-oval, imbricate scales. The length three feet four inches and a half; thickness near the head about three inches; the middle of the trunk four inches and a half. The tail measures only eight inches, is a little compressed, tapers moderately, and terminates in an obtuse point.

[Coluber Cerberus.]

[illegible] part of the head is almost black; the colour of the trunk and tail a very dark grey; the throat, belly, and under part of the tail are of a dusky yellow; but the colour of the scuta seemed to have been changed by the spirits.'

Dr. Russell further observes that his specimen, which our figure is taken, was sent from Ganjam in J 1788, and that he never saw one alive. He adds that withstanding its suspicious appearance, the want of poison organs shows that the snake is not formidable.

CERCA'RIA. [Microzoaria.]

CE'RCERIS. [Hymenoptera, Fossorial.]

CERCIS SILIQUASTRUM, the Judas tree, so called from the tradition that it was upon a plant of it, near Jerusalem, that the betrayer of our Saviour hanged himself, is a leguminous tree, common on the shores of Asia Minor, and in all the East. Dr. Walsh speaks of it as abounding in the Levant at the present day, clothing the shores of the Bosporus and the sides of Mount Libanus. It is very beautiful in all its stages. Very early in spring, flowers of a bright pale red burst out before any leaf appears, not only from every part of the branches, but from the trunk, piercing the thick strong bark nearly down to the root in a very remarkable manner, and it is for this reason called *red bud.* These buds are gathered and used with other raw vegetables by the Greeks and Turks in salads, to which they give an agreeable colour and taste. It is very common in England, where it proves quite hardy, but it does not flower well unless in a very sheltered situation, or when trained to a wall. There is a pale, almost white, flowered variety, and also an American species (*C. Canadensis*), but neither are worth cultivation.

CERCOCE'BUS. [Guenon.]

CERCOPITHE'CUS. [Guenon.]

CERDAGNE, FRANÇOISE (French Cerdagne), a district ceded by Spain to France, in 1660, in virtue of the treaty of the Pyrenees. Its extent, according to the 'Dict. Univ. de la France,' is about 16 or 17 miles, its breadth about 11 miles. It is a mountainous country, and contains the springs of the Sègre, a Spanish river, and of the Teth or Tech, which belongs to France. Its capital was Mont Louis. It is now comprehended in the department of Pyrénées Orientales, or Eastern Pyrenees.

CEREOPSIS, a genus of birds established by Latham, and placed by him (1802) among the waders (Grallatores); but there is a probability that it was described from a mutilated specimen; for on the republication of his 'General History' (1824), he modified the characters, and though he still kept the genus in the order to which he had already assigned it, he placed it as the last of the series, and next to the swimmers, Palmipedes. (*Anseres*, Linn.) Temminck, about the same year in which Latham's republication appeared, figured it in his 'Planches coloriées,' (pl. 206,) and gave it a proper place at the head of the swimmers. Mr. Bennett ('Gardens and Menagerie of the Zoological Society,' a work of considerable research and beautifully illustrated) shows that the bird had been observed by nearly all the navigators who had visited the south coast of New Holland and its neighbouring islands from 1792 downwards.

Generic Character.—Bill short, elevated, obtuse, covered by a broadly expanded cere, except at the extremity, which is somewhat vaulted and truncated. Nostrils large, situated about the middle of the bill, and open. Feet with tarsi (shanks) longer than the middle toe, and bare of feathers a little way above the knees; great toe articulated to the posterior part of the tarsus; anterior toes palmated, and united with membranes deeply notched or cut out as it were, so as to appear scarcely to reach beyond the half of their length; nails long and strong; wings ample; wing-coverts nearly as long as the quills; first quill a little shorter than the succeeding ones. Tail-feathers sixteen.

The only species known is *Cereopsis Novæ Hollandiæ*, about the size of the common goose and nearly of the same carriage, with the exception of the length of the legs. Temminck gives the length at from two feet and a half to three feet. We select Mr. Bennett's description because it rectifies some oversights in Temminck's—oversights which may probably be accounted for from the latter having written his description from a skin, or at most from a preserved bird, and because Mr. Bennett's description accords with our own observations. 'A broad patch on the top of the head is of a dull white, and the rest of the plumage of a dingy grey, deeper on the upper than on the under parts, having the extremity of each of the feathers of the back margined with a lighter band; and most of the wing-coverts and secondary quill-feathers marked with rounded dusky of from two to four lines in diameter. On the feathers the back and shoulders the spots are much larger, assume an angular or semilunar form, and approach more nearly the general colour of the plumage. The quill-feathers both of the wings and tail are dusky black throughout the greater part of their extent. The naked extremity of the bill is black; the broadly expanded cere of a light straw or lemon colour; the irides light hazel; the naked part of the legs reddish orange; and the toes, together with their web and claws, and a streak passing for some little distance up the fore part of the leg, black.'

Anatomy.—At a meeting of the 'Committee of Science and Correspondence of the Zoological Society,' January 25, 1831, Mr. Yarrell stated* that having examined the body of an individual which had died at the society's menagerie in the Regent's Park, he had remarked that its trunk was much shorter than that of the true geese, and more triangular in its shape: the pectoral muscles were large and dark coloured. The trachea was of large but nearly uniform calibre, without convolution, and attached in its descent to the right side of the neck, as in the heron and bittern; in the form of its bone of divarication and bronchiæ, it most resembled the same part in the geese. The muscles of voice were two pairs; one pair attached to the shafts of the os furcatorium, the other to the inner lateral surface of the sternum. The lobes of the liver were of large size, morbidly dark in colour; their substance broke down under the finger on the slightest pressure. The stomach, a true gizzard, was of small size as compared with the bulk of the bird. The first duplicature of intestine was six inches in length, at the returning portion of which the biliary and pancreatic ducts entered; from thence to the origin of the cæca, four feet six inches; the cæca, nine inches each; the colon and rectum together, five inches; the whole length of the intestines was seven feet five inches. The stomach and intestinal viscera were loaded with fat; the other parts exhibited nothing remarkable.

Internally this bird, which was a male, resembled the true geese; but externally, in the character of the bones, particularly in the rounded form of the edge, and great depth of the keel of the sternum, and the lateral situation of the trachea in reference to the cervical vertebræ, it was decidedly similar to the *Ardeidæ* (herons).

Mr. Yarrell availed himself of the occasion to remark, that the *Natatores* (swimmers) of Mr. Vigors's systematic arrangement in ornithology were placed between the *Grallatores* or waders on the one side, and the *Raptores* or birds of prey on the other; and that the order contained five groups, two of which, the *Alcadæ* and *Colymbidæ*, were called normal, containing those birds which were considered to be the types of the true swimmers, and three groups, *Anatidæ*, *Pelecanidæ* and *Laridæ*, called aberrant, as deviating from the type, and exhibiting some characters which connected them either with the *Grallatores* or the *Raptores*. Some of the *Laridæ* and *Pelecanidæ* in the length of their wings, their consequent power of flight, and the mode of their taking their food in the air, exhibited their obvious affinity to the birds of prey on the one hand; while some of the *Anatidæ*, by their lengthened legs and neck, and their habit of passing much of their time on land, or frequenting shallow pools of water, showed an equal affinity to some of the waders. This was the case with the *Cereopsis*, and occurred also in the semipalmated goose, and in another goose then living in the Society's Gardens, the *Anser jubatus* of Spix. It was stated that in proportion as these birds departed from the character of the true geese in their external appearance and habits, and in both approached to the *Ardeidæ*, they would also be found on examination to resemble them in their internal organization. In proof of this, an extensive series of parts of the skeletons of birds from the true divers to the cranes was exhibited, and the peculiarities pointed out. The keel of the breast-bone in the ducks and true geese was shown to be of considerable depth, with its inferior edge nearly straight; those of the semipalmated goose and *Cereopsis* were shown to be much deeper in the keel, and the inferior edges much more convex; and comparison with the same parts from the spoonbill, herons, bitterns, and storks, showed the approximation to the *Ardeidæ* in form. The peculiarities of the whole series indicated, between the two extreme points the development of the power of flight, as contrasted with the maximum of the powers of diving, in a succession of characters as easily recognisable in the skeleton as in the external appearances of the birds themselves, and supplied a valuable auxiliary chain of affinities to assist the naturalist in his views of arrangement.

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* 'Proceedings, &c.,' part i., p. 25.

Habits, &c.—Mr. Bennett observes (1831), in 'the Gardens and Menagerie' above quoted, that 'M. Temminck states that we have as yet no positive information with regard to the manners, habits, and mode of feeding of the *Cereopsis;* but this assertion falls to the ground, now that we have ascertained that the bird has been noticed by so many travellers. It is true that the limited opportunities that have occurred of observing it in a state of nature, have precluded the possibility of obtaining a complete history of its habits and mode of life; but the accounts furnished by various writers lead directly to the inference that it resembles the wild geese of the northern hemisphere as closely in those particulars as in general conformation. We cannot state with certainty whether it is equally migratory; but Captain Flinders, who found it at one period of the year so abundant on Goose Island as fully to justify the appellation, adds that it was by no means so numerous at a different season, and this fact necessarily implies at least a partial change of locality. In its manners it appears that it is by no means so shy as our northern geese, a circumstance which probably depends on the little disturbance that it has hitherto met with in its native haunts. Labillardière tells us that many of those first seen by him suffered themselves to be taken with the hand; but the rest becoming apprised of their danger speedily took to flight. Considerable numbers were taken by the crew of Captain Flinders's vessel, both at Lucky Bay and Goose Island, by knocking them down with sticks, and some of them were secured alive. According to M. Bailly those seen by him at Preservation Island evinced so little shyness, and suffered themselves to be approached so readily, that his boat's crew were enabled to procure without any trouble a sufficient quantity to victual them during their stay. The flesh of these geese, as they are called, is described by Bass as being excellent. D'Entrecasteaux considered it much more delicate than that of the European goose; and Flinders adds that on Preservation Island it formed the best repasts of his men. Mrs. Lewin simply states that it is well flavoured.'

'It would seem that this bird does not often leave the coast to visit the interior of the country, for M. Riche, who was lost by his companions for more than two days at Espérance Bay, never met with it in the course of his wanderings in search of them. M. Bailly states that on Preservation Island it takes up its abode on the grassy declivities; and Captain Flinders found it on Goose Island, amongst the grass and on the shore: "it feeds," he says, "upon grass, and rarely takes to the water." Its usual weight is from seven to ten pounds. According to Mr. Bass, it has a deep, hoarse, clanging, and though a short, yet an inflected voice; and to the accuracy of this observation we can ourselves bear testimony.'

'With regard to its domesticated habits little is known. Judging from Mrs. Lewin's communication to Dr. Latham, it would appear that it had at one time been introduced into the colony as a denizen of the farm-yard; for that lady stated, "that with management it becomes very tame and familiar, so as to be domesticated with our common goose." But its cultivation seems now to have been entirely abandoned, for we do not observe any notice of it in the numerous works treating of the colony that have been published of late years; and MM. Quoy and Gaimard, the naturalists of a late French expedition which made a considerable stay at Port Jackson, expressly mention having seen a single superb specimen of this very rare bird feeding upon grass in the governor's garden.

'The four living specimens in the Society's Garden, together with four others at present at the farm on Kingston Hill, formed part of the extensive collection kept by his late Majesty in the Great Park at Windsor. They bred there as freely as the emeus or any of the other animals of New Holland, and are all descended from one pair originally brought to this country. They are perfectly tame, and in their behaviour closely resemble geese, but show more disposition to become familiar. There can be little doubt that they exceed in number all the stuffed specimens that exist in public collections in Europe; the latter, so far as we are aware, being limited to one in the British, one in the Paris, and one in the Berlin museum.' Our drawing was made from a pair with a brood hatched in the Zoological Society's Garden in the Regent's Park, London.

[Cereopsis Novæ Hollandiæ.]

CERES, a planet, discovered by Piazzi on the first day of the present century (January 1, 1801), at Palermo. It was called by him Ceres, after the name of the tutelar goddess of Sicily, and for analogy with the names of the other planets. His first appellation was Ceres Ferdinandea, in honour of the reigning sovereign, but his contemporaries dropped the adjective.

It was suspected by Kepler that some planet existed between Mars and Jupiter, which was an idea derived from observing the mean distances of Mercury, Venus, the Earth, Mars, and Jupiter from the sun, which are as

39, 72, 100, 152, and 520.

The greatness of the interval from 152 to 520 led to the suspicion, which is rendered remarkable by its verification.

The discovery of Uranus by William Herschel, in 1781, put astronomers on the alert, and disposed them to think that the number of the planets was not even yet complete. Piazzi, in forming his large catalogue, examined each new star for several successive evenings before inserting it, and Delambre was in the habit of doing the same. An association of twenty-four astronomers was formed by De Zach, who were to divide the heavens among them, and hunt every corner for moving stars. Piazzi however was the first who succeeded. On the evening above mentioned he was searching for a star marked in Lacaille's zodiacal catalogue, and found that it was accompanied by another of the eighth magnitude. He set himself accordingly to determine its place, and following his usual practice, he found, by observing it on the second and third of the month, that it had a decided motion. He followed its course till the twenty-fourth [illegible] month, when he was interrupted by illness, and by the [illegible] he was able to resume his observations the planet was l[illegible] the rays of the sun. In the meanwhile he communicated the discovery throughout Europe; orbits were calculated from the observations he had made by M. Olbers, Burckhardt, and Gauss, and the planet was found again on December 31, by De Zach, and by Olbers on the day following. It was at first supposed to have been a comet; and Piazzi himself was of that opinion for some time. The stimulus given by this discovery was the cause of the almost immediate discovery of VESTA, JUNO, and PALLAS, all moving in orbits very close to each other and to that of Ceres, which comes between Juno and Pallas.

Ceres is a telescopic object, varying its appearance, according to its distance from the earth, from the seventh to the eighth magnitude. Its apparent [illegible] is very small, and its magnitude must [illegible] considerably less than that of our moon, but how much [illegible] not been well settled. The elements of its orbit are as follow

Mean distance from the sun, that of earth being unity	2·767245
Revolution in mean solar days	1681·3931
Mean synodical revolution in days	466·62
Mean daily motion	12′ 50″ ·9
Longitude of perihelion January 1820	147° 7′ 31″ ·5
Yearly increase of ditto	121″ ·3
Inclination of the orbit, January 1 1820	10° 37′ 26″ ·2
Yearly decrease of ditto	− 0″ ·44
Longitude of node, January 1, 1820	80° 41′ 24″
Yearly increase of ditto	1″ ·5
Excentricity	·078439
Greatest equation of centre	8° 59′ 42″

For an annual ephemeris, see the *Nautical Almanac*.

CERET. [Pyrenees Orientales, Department of.]

CE'RIA, a genus of Dipterous insects of the family *Syrphidæ*. Technical characters:—head longer than the thorax; antennæ longer than the head, inserted on a petiole, the second and third joints forming an oval mass; stylet terminal and short; abdomen cylindrical; submarginal nervure of the wings much bent, and throwing out a rudiment of another nervure.

But three species are known of this genus; the colouring is black and yellow, which, together with an elongated and somewhat ovate form of body, gives them a resemblance to wasps. Only one of the three has been discovered in England, and that is extremely rare—it is the *Ceria conopsoides*, and is about half an inch long; black, front of the head yellow in the male, black and yellow in the female; petiole of the antennæ elongated and yellow beneath; sides of the thorax with yellow spots; scutellum yellow, with the apex black; the second, third, and fourth segments of the abdomen, with their margin, of the same colour; legs yellow; exterior margin of the wings brown.

This species appears not to have been found abundant anywhere; the other two differ but slightly from the one just described.

CE'RIGO, the antient Cythéra (Κύθηρα), one of the seven Ionian islands, lies south of the coast of the Morea, 13 miles S.W. of Cape Malea, and 25 miles E. of Cape Tænarus, now called Matapan, and at the entrance of the Gulf of Laconia. Its south extremity is about 45 miles N.N.W. from Carabusa, the nearest part of Candia. Cerigo is of an oval though irregular shape, and about 20 miles long from N. to S., and 10 miles in its greatest breadth. The island is mountainous and rocky: but there are several small valleys and dales, where the soil is fertile and well cultivated. It produces excellent grapes (of which good wine is made), oil, oranges, lemons, and other fruit, sufficient corn, and some cotton. Cerigo is better stocked with cattle than any of the other Ionian islands: it reckons about 3000 horned cattle, 16,000 sheep and 4000 goats, besides 1100 asses and about 150 horses. (Neigebaur, *Ionische Inseln*.) The inhabitants, by the official returns of 1833, were 8759, distributed in two market-villages and twenty-nine hamlets. The area of the island is 116 English square miles, including the little island of Cerigotto, which lies halfway between it and Candia. There are at Cerigo 9 free-schools [illegible] by the government and attended by above 380 [illegible]

[illegible] principal town, or rather village, of Cerigo is Capsali, on the south coast. On the east coast is the village of S. Nicolo, with the best anchorage in the island. In the neighbourhood are a number of antient tombs cut in the rock; and not far from them are some remains of walls, substructures, and broken pillars, supposed to be the relics of antient Cythera, and of its celebrated temple dedicated to Venus. The spot is called Palæo Castro. On the west coast of the island is Porto Delfino, a large but unsafe natural harbour. Cythera is supposed to have been originally colonised by the Phœnicians. The Lacedæmonians early took possession of it, as it lay conveniently for the protection of their own coasts, as well as a port for vessels coming from Egypt and Africa.

In the Peloponnesian war, the Athenians invaded Cythera, took Scandea on its S. coast, and afterwards attacked the town of Cythera, which they took, after some resistance, and carried off its inhabitants. (Thucydides, iv. 54.) It was retaken by the Lacedæmonians. Afterwards it was taken possession of by the Macedonians, and lastly by the Romans. In the twelfth century of our era it was subject to the despots of the Morea, and was lastly taken by the Venetians, who kept possession of it till the fall of their republic. It now forms one of the Ionian Islands under English protection. A detachment of English troops does garrison duty at Cerigo, besides which there is a native militia.

CERINTHUS, whence the word 'Cerinthians,' by which his followers were denominated, was by descent a Jew, and born not many years after, if not before, the death and ascension of Christ. His family appears to have been one of those who were settled without the limits of Palestine towards the north. Perhaps he studied in the schools of Alexandria. But of his own history little is known, and the preservation of his name and memory is owing to certain peculiarities of opinion, by which he was distinguished from other followers of Christ, having led to the mention of him in the writings of some of the earliest Christian fathers, and in catalogues which were early formed of Christian heretics. The fathers who especially notice him are Irenæus, Epiphanius, and Theodoret.

Cerinthus was one of those persons, who looked upon the doctrine of our Saviour as not intended to supersede the doctrine of Moses and the Scribes, but to be engrafted upon it, and when perfectly received to be taken in union with the doctrine and institutions of his own nation, even to the point of circumcision. This opinion prevailed very extensively in the first age of the church, as is evident from much of the New Testament. But Cerinthus had some notions more peculiar concerning the creation of the world and the person of Christ. Departing from the simplicity of the Mosaic doctrine, that 'In the beginning God created the heavens and the earth,' he maintained that the creation was the effect of some angelic virtue, to use the almost unintelligible phrase of the self-called philosophy of that age and nation. He maintained that Jesus of Nazareth was the son of Joseph and Mary, and that at his baptism the Christ, the Son of God, descended upon him in the form of a dove, and became united to him, and that thus it was that Jesus became acquainted with the great unknown Father, and was empowered to work miracles; that at the crucifixion Jesus only suffered, while Christ remained untouched, and leaving Jesus returned to heaven. These opinions are attributed to him by Irenæus, a very early Christian writer. Authorities less respectable represent him as having denied the resurrection, and as having taught men to expect the reign of Christ for a thousand years on earth, when the saints should delight themselves in all terrestrial enjoyment.

However, he seems by common consent to have been placed among those who held singular opinions in the Christian church, called Heresies. Epiphanius names him as one of those who opposed St. Peter and St. Paul. St. John the apostle and evangelist is also said to have personally opposed him. The following story is told. The baths in ancient times were places of public resort: St. John, being [illegible]phesus, repaired to the bath, but happening to find [illegible] there, he left the place without bathing, observing to his friends, that it was proper to leave it lest the building should fall, so great an enemy to the truth as Cerinthus being within it. This anecdote is related by Irenæus, who says they who told him had it from Polycarp, a contemporary and friend of St. John. Such an anecdote is important, not so much on account of itself as of the way in which it has been transmitted; showing how the writers of the New Testament, and the persons named in it, are connected with the writers and persons of the succeeding age, and they again with the men of the age succeeding them. Irenæus also says that St. John wrote his Gospel with the express intention of confuting the errors of Cerinthus.

The reader may consult Conyers Middleton's works, vol. ii., p. 107-120, for an examination of this anecdote about St. John and Cerinthus, which he endeavours perhaps unsuccessfully to discredit.

CERIO'PORA. [Milleporidæ.]

CERI'THIUM. [Entomostomata.]

CE'RIUM, a peculiar metal discovered, in 1804, by Hisinger and Berzelius, in a mineral previously confounded with wolfram, and now called *cerite*.

Cerium is not easily obtained in the metallic state by the usual processes, the [illegible] being with great difficulty reduced by charcoal; it is best procured by decomposing the chloride by potassium. The properties of cerium are that it is pulverulent, its colour varying from deep chocolate brown to rose-red, and by friction it acquires a greyish shining appearance. This powder however does not conduct electricity, and by exposure to the [illegible] it emits a smell of hydrogen, and its colour becomes gradually paler. When heated, it burns long before redness. It decomposes water readily, even at 32° Fahrenheit; and in boiling water the effervescence is brisk, owing to the evolution of hydrogen gas. Cerium inflames in the vapour of sulphur and gaseous chlorine, but is not acted upon by the vapour of phosphorus.

Oxygen and cerium combine to form two oxides. The protoxide consists of nearly

1 equivalent of oxygen	8
1 " cerium	46
Equivalent	54

It does not form neutral salts with acids, nor does it combine with alkalies. This oxide has not yet been obtained dry or anhydrous; in the state of hydrate it is white, and insoluble in water. By calcination, the water is readily expelled, and the residue is a mixture of the protoxide and peroxide of cerium. When the moist hydrate is exposed to the air it quickly changes, by absorbing carbonic acid and oxygen; and there are formed protocarbonate and hydrate of the peroxide.

Sesquioxide of cerium is composed of

1½ equivalent of oxygen	12
1 " cerium	46
Equivalent	58

It is of a brick red colour, and appears to be infusible, and is undecomposable by heat. It combines with acids, and forms salts, which have always an acid reaction when they are soluble in water. The hydrate of the peroxide is of a bright yellow colour, which becomes deep yellow by heat, and is easily decomposed by it. It is not dissolved either by ammonia, potash, or soda; but the alkaline carbonates dissolve a little, and become of a yellow colour.

Chlorine and cerium combine, and the compound is a white porous mass, which is fusible at a red heat, and is soluble in water. It is composed of

1 equivalent of chlorine	36
1 " cerium	46
Equivalent	82

Bromine and cerium probably form two compounds. When the oxide of cerium is dissolved in hydrobromic acid, a colourless liquid is formed, which, when evaporated to dryness, gives out hydrobromic acid; it afterwards softens into a viscid mass, and again becomes dry. When this is heated to redness, a little bromine is given out, and there remains an insoluble oxybromide of cerium. The pure bromides appear to be obtained with great difficulty.

Fluorine and cerium.—This compound occurs at Finbo with orthite. It is crystallized in regular six-sided prisms. It appears to be a protofluoride. A pure perfluoride also in nature in a state of purity; an oxyfluoride is met with.

Sulphur and cerium combine to form probably two compounds. That which is best known is composed of

1 equivalent of sulphur	16
1 " cerium	46
Equivalent	62

When the sulphuret is procured by the action of sulphuret of carbon it is of a cinnabar red colour; but when by sulphuret of potassium, it is in small transparent yellowish green crystals or scales, which resemble aurum musivum in appearance. The composition is however similar in both cases.

At a heat below redness sulphuret of cerium inflames, gives out sulphurous acid, and subsulphate of cerium remains. It is acted upon by nitric acid, and sulphur is deposited. Muriatic acid evolves sulphuretted hydrogen; chlorine acts readily upon it, but neither iodine, phosphorus, nor potassium decomposes it. Sulphuretted hydrogen does not act upon the solutions of cerium; but the soluble sulphurets decompose the solution of the chloride, and throw down a white precipitate, which is a hydrated sulphuret; with the persalts of cerium a deep green precipitate is produced by the sulphurets, which [illegible] probably a hydrated sesquisulphuret.

Selenium and cerium [illegible] form a powdery reddish-[illegible] compound which has a disagreeable smell; when heated [illegible] selenious acid, and is converted into a white powdery subselenite. The sulphuret of selenium is not altered by water, but all acids dissolve it readily [illegible] the disengagement of seleniuretted hydrogen.

Phosphorus and cerium form by combining [illegible] powder, which, by exposure to heat and air, gradually becomes white, and is converted into phosphate.

Carbon and cerium, when united, form probably a qu carburet of cerium; it is black, interspersed with bril points, and weighs as much as the oxide of cerium ployed in forming it. When exposed to the air it burns spontaneously, like a pyrophorus, and is converted into red oxide of cerium, and carbonic acid gas.

Salts of cerium.—Both the protoxide and sesquioxide of cerium form salts with acid. The protosalts are colourless, their taste is saccharine; they always turn litmus paper red; the greater number are soluble in water, and even in alcohol. They are not decomposed by sulpuretted hydrogen, but the sulphurets produce this effect. The ferrocyanide of potassium occasions a white milky precipitate, which is soluble in acids; the alkalies throw down a white precipitate, which is insoluble in an excess of them; tincture of galls produces no effect.

The salts of the sesquioxide of cerium [illegible] generally of a yellowish-red colour. When the solutions are concentrated, sulphate of potash is precipitated in the state of a yellow double sulphate.

Protonitrate of cerium does not readily crystallize; its taste is at first sharp, and afterwards very sweet. Its solution is colourless; water and alcohol both dissolve it in large quantity. When it is heated it first swells up, and is afterwards converted by heat into peroxide and nitrous acid.

Pernitrate of cerium.—The solution does not readily crystallize without an excess of acid; the crystals are white, lamellated, deliquescent, and soluble in alcohol. When dried, they become yellow. The solution decomposes spontaneously by keeping, and a yellow subsalt subsides, and an acidulous salt remains in solutio The admixture of a small quantity of nitrate of iron renders the solution of this salt blood red; it readily decomposes by heat.

Carbonate of cerium.—The protocarbonate is in white pearly scales; it is decomposed by heat, and by acids.

Protosulphate of cerium.—This salt may be obtained in colourless crystals, which are soluble in water, and require a high temperature to decompose them. The alkalies decompose this sulphate immediately, double sulphate being formed.

Sulphate of cerium is composed of

1 equivalent of protoxide	54
1 " acid	4[illegible]
Equivalent to	94

Persulphate of cerium.—The solution of this salt is of an orange colour, and its crystals are prismatic, and of a golden hue. It is not a permanent salt, for it gradually becomes a mixture of super-protosulphate, and sub-persulphate. It is but imperfectly decomposed by the alkalies, forming, like the protosulphate, double salts with [illegible]

Phosphate of cerium is a colourless insoluble [illegible] soluble in excess of acid, but dissolved in nitric and [illegible]riatic acids.

The principal minerals which contain cerium are considered as silicates—they are, cerite, orthite, godolenite, and allanite

CERIUM, ORES OF—1. *Cerite*, found near Riddarhittan, in Sweden; it occurs amorphous. Its colour is pale dull red, sometimes greyish, and its streak is white; its lustre is resinous, slightly translucent, and sufficiently hard to give sparks with steel, or 5·5. Sp. gr. 4·912.

According to Hisinger, it consists of

Silica	18
Peroxide of cerium	68·59
Peroxide of iron	2·00
Lime	[illegible]
Water and carbonic acid	[illegible]
	99·44

Dr. Thomson con[illegible] as [illegible]hydrous silicated of cerium.

2. *Cerine*, found as above; occurs massive [illegible] fect crystals. Colour brownish-black, streak bro[illegible] opaque, with an imperfect metallic lustre. Har[illegible] gr. 4·173. Composition according to Berzelius

Silica . .	30·7
Oxide of cerium	28·19
——— iron	20·70
——— copper	0·87
Alumina .	11·7
Lime .	9·12
Volatile matter	0·40
	100·42

3. *Allanite*, found at Alluk, East Greenland. It occurs massive, and crystallized in the form of a doubly oblique prism. Fracture imperfect conchoidal. It is opaque, with an imperfect metallic lustre. Colour brownish-black, streak greenish grey. Hardness, 6·0. Sp. gr., 4. It is composed, according to Stromeyer, of

Silica . . .	33·021
Protoxide of cerium .	21·600
——— iron .	15·101
——— manganese	0·404
Alumina . . .	15·226
Lime . . .	11·080
Water . . .	3·000
	99·432

These are among the principal ores of cerium, but for an account of some others, consult Phillips's *Mineralogy*, and Thomson's *Outlines of Geology*.

CERO'COMA, a genus of Coleopterous insects, of the family Cantharidæ (Latreille). Technical characters:—Antennæ short, nine-jointed, the basal joint as long as the two following, the second and next joints in succession are short and gradually increase in width to the apex of the antennæ; the terminal joint forms a distinct ovate knob; palpi moderate, all the joints of nearly equal width—such are the characters of the females. The males have the antennæ short, thick, and the joints extremely irregular in shape and size; those towards the base are uncommonly large, the terminal joint forms a large flattened knob, the joints immediately adjoining are the smallest—the palpi are also very much developed, the basal joints being very large. The head and thorax are rounded at the sides and of about equal width, the elytra are narrow, somewhat linear, elongate, and soft.

About six species of this genus (so remarkable for the extraordinary antennæ of the males) have been discovered, all of which are European; they make their appearance during the summer months, and frequently in great numbers in the same spot. They are found on flowers, particularly those of the wild chamomile, &c.

Cerocoma Schæfferi is about half an inch in length, and of a bright golden green above, or bluish; the legs and antennæ are yellow. In the female the base of the thighs and the tarsi are black. The colour of this species and the texture of its wings closely resembles that of the common blister beetle—the general form of the body is not very dissimilar; it is of a smaller size. This species is common in France.

CERO'PALES, a genus of Hymenopterous insects. [P[illegible]us.]

[illegible]OXYLON ANDI'COLA, the wax-palm of South [illegible]rica, is one of the most remarkable plants in the large [illegible]ral order to which it belongs. It is a species with pinnated leaves, and panicled polygamous flowers. Its calyx consists of three small scales; the petals are also three, but much larger and sharp-pointed. The stamens are nume-[illegible] with very short filaments. The fruit is a little round [illegible]rupe, with a single seed of the same figure.

This plant has received from the American Spaniards the name of *Palma de Cera*, or wax-palm, on account of the abundance of that substance yielded by the stem. It grows, according to Bonpland, in that part of the Andes which separates the valley of the Magdalena from that of the Cauca river, in 4° 35′ N. lat. Below the snow-capped mountains called Tolima, San Juan, and Quindiu, especially the last, the Ceroxylon grows in all its grandeur, elevating its majestic trunk, coated with a thick incrustation of wax, to the height of 180 feet among the most rugged precipices of the wild region which it inhabits. Unlike the greater part of the palm tribe, this species avoids the heat of tropical plains, and seems incapable of existing except in regions where the temperature is lowered by elevation in the air, and the contiguity of perpetual snow. It is said to make its first appearance on the sides of the Quindiu at a height equal to that of the Puy de Dome or the passage of Mont Cenis; this is higher than the region of Cinchonas, and so cool, that Humboldt does not estimate the mean temperature of the year higher at the utmost than 65° or 68° Fahr., which is at least 17° lower than the mean temperature of palm countries. It does not extend over more than 15 or 20 leagues of country altogether. Its roots are fibrous and very numerous, the main root being thicker than the stem itself. The trunk is distinctly marked by rings caused by the fall of the leaves, which are from 18 to 20 feet long. The spaces between the rings are pale yellow, and smooth like the stems of a reed, and covered with a thick coating [illegible]ax and resin. This substance, melted with a third of [illegible]akes excellent candles. Vauquelin ascertained that [illegible] vegetable matter consists of two-thirds resin, and one-third wax, which is only a little more brittle than bees-wax. The only parallel among palms to this property of exuding wax, occurs in a Brazilian palm with palmated leaves, called *Carnauba*.

[Ceroxylon Andicola.]

CERTHIA. (Zoology.) [Creeper.]

CERTHI'ADÆ. [Creeper.]

CERTHILAU'DA. [Larks.]

CERTIORA'RI, in law, is a writ issuing from one of the superior courts, directing the judges or officers of an inferior court to transmit or cause to be certified (*certiorari facias*) records or other proceedings. The object of the removal is either that the judgment of the inferior jurisdiction may be reviewed by the superior court, or that the decision and the proceedings leading to it may take place before the higher tribunal. An instance of the former is where the convictions of magistrates or the judgments or orders of courts of quarter-session are removed by certiorari into the Court of King's Bench by way of appeal against their validity, in which case the decision which has previously been given is re-considered, and is either confirmed or set side. An instance of the latter is where an indictment found against a peer by an inferior jurisdiction is certified or transmitted into the Court of Parliament or the

Court of the Lord High Steward, in order that the fu proceedings and the adjudication may take place before proper tribunal. By this writ, indictments, with the ceedings thereon, may, at any time before actual trial, removed from the assizes or quarter-sessions into the Court of King's Bench, as the supreme court of ordinary criminal jurisdiction. A certiorari for this purpose must be granted on the application of a prosecutor as a matter of right; but when applied for by a defendant, it is a matter of discretion, and is generally refused, unless under very peculiar circumstances. In order to avoid the occurrence of frivolous appeals, it is usual in statutes which give summary jurisdiction to inferior tribunals to restrict, or altogether take away, the right to a certiorari.

CERUSE. [LEAD, CARBONATE OF.]

CERVANTES. [SAAVEDRA.]

CERVICOBRANCHIATA. (Zoology.) De Blainville's second order of his sub-class *Paracephalophora Hermaphrodita.*

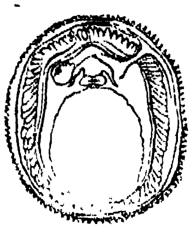
Character of the order. Organs of respiration in a large cavity situated above the neck, and opening widely in front. Head distinct, with two conical contractile tentacula; eyes sessile at their external base.

Family 1. *Retifera.*

Organs of respiration in the form of a net on the *plafond* of the branchial cavity.

Genus Patella. (Limpet.)

Body more or less circular, conical above, flat below, and furnished with a large oval or round foot, which is thick and overpassed on the whole of its circumference by the edges of the mantle, which are more or less fringed. There is a complete series of vertical membranous plaits in the line of junction of the mantle with the foot.



[Animal of Patella.]

Shell oval or circular, with an upright summit, or more or less curved forwards. The cavity simple, and more or less deep: the border entire and horizontal. Muscular impression narrow, in the form of a horseshoe, opening forwards.

Such is De Blainville's arrangement and description: and, before we proceed further, it will be necessary to advert to Cuvier's remarks upon them. The latter places *Patella* under his Cyclobranchians (*Cyclobranches, Cyclobranchiata*), the eighth order of his (Cuvier's) Gastropods; and in the last edition of the 'Règne Animal' has the following note: 'M. de Blainville, who gives the name of *Cyclobranches* to the order under which he arranges the *Dorides*, makes of the three preceding genera (*Fissurella, Emarginula* and *Parmophorus*) and of the *Patellæ*, an order which he names *Cervicobranches*, and which he divides into the *Rétifères* and the *Branchifères*. The *Rétifères* are the *Patellæ*, because he supposes that they respire by means of a net-work belonging to the cavity which is above their head. I have found it impossible to discover it; nor have I been able to see any other organ of respiration than the cordon of leaflets (feuillets) which is carried all round under the border of the mantle.' And he refers to his anatomy of the *Patella* in his Memoirs on the *Mollusca*.

Cuvier thus describes the genus: 'The *Patellæ* have the body entirely covered by a shell made of one entire piece, shaped like a widened cone (*en cône évasé*). Under the edges of the mantle is a border (cordon) of small branchial leaflets (feuillets). The vent and the outlet of the generative organs are a little to the right above the head, which is furnished with a large and short proboscis, and two pointed tentacula, carrying the eyes at their external bases. The mouth is fleshy, and contains a spiny tongue, which goes backwards and is folded back deeply in the interior of the body. The stomach is membranous, and the intestine is long, delicate, and very much folded. The heart is forwards, above the neck, a little to the right.'

G. B. Sowerby ('Genera of Recent and Fossil Shells') says, 'there is no canal for the passage of water to the branchiæ, as there is in *Emarginula* and *Siphonaria*, for in this [illegible] nchiæ are external, surrounding the animal.' [illegible] ws Cuvier, and his description of the animal differs but little from that given above. The th [illegible] he terms not inaptly un long ruban lingual épine [illegible] thus defines the genus. 'Animal furnished with [illegible] and eyes at their external base; branchiæ forming a cordon of leaflets; shell univalve.' He afterwards [illegible] more detailed description of the shell, and makes the following observation: 'M. de Blainville believes that he has perceived the branchiæ of the *Patellæ* in a vascular network attached to the *plafond* of a branchial cavity. Not having been able to distinguish this net-work, we think with Cuvier that the organ of respiration shows itself in these animals in the circle of leaflets which surrounds the body between the foot and the mantle as in the Phyllidians.'

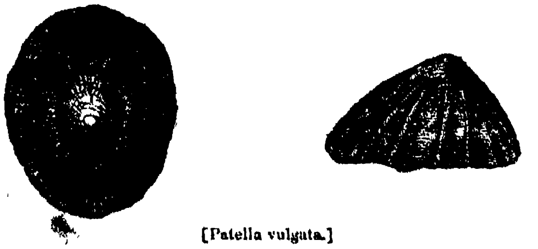
Lamarck placed it among the Phyllidians and next to Chiton, and gave a very good account of the organization of the animal; and Deshayes, in his valuable edition of the 'Animaux sans Vertèbres,' adds to Lamarck's observations the following remarks: 'Till very lately naturalists had agreed upon the proper place of the *Patellæ* in the series of mollusks; to convince us of this fact, it will be sufficient if we cast our eyes on the different methods which have been published since the system of Linnæus. Nevertheless, a highly distinguished naturalist, M. de Blainville, in his 'Treatise on Malacology,' has looked upon this genus with views different from those entertained by his predecessors. All naturalists had admitted without controversy, that the small leaflets placed in the groove of the foot and the mantle of the *Patellæ* were true branchiæ, comparable in all points to the branchiæ of the Phyllidians and Chitons. It was enough, in fact, to examine these leaflets with attention, to be satisfied as to their eminently vascular nature, and by a natural consequence to regard them as a respiratory organ in a situation which is common to other mollusks. M. de Blainville rejected this opinion, and perceiving in the part of the mantle which forms the cervical sac sufficiently regular striæ, he regarded this part as a true branchia or gill, and characterized the genus in consequence of this new opinion. By another consequence he changed the affinities of the genus, out of which he formed at the end of the hermaphroditic mollusks, a small particular family under the name of *Retifera*, and composed of a single genus—that now before us. This new mode of viewing the subject by M. de Blainville demanded an attentive and serious examination previous to its adoption. Many methods present themselves for ascertaining if, as this zoologist believed, the cervical sac of the *Patellæ* serves them as a respiratory organ. We have compared with this part in the *Patellæ* that of many genera, the position of whose branchial organ has never been doubted—that of the *Calyptrææ*, for example; and we have recognized a fibrous structure and striæ entirely comparable to those which are seen in the *Patellæ*. We have pursued our comparison, not only in the mollusks with a patelliform shell, but further in those whose shell is more or less rolled up or spiral; and in all, without exception, we have found the upper wall of the cervical sac resembling that of the *Patellæ*. It must, then, be admitted, that in all the mollusks which have evidently a branchia, the cervical sac fulfils, as in the *Patellæ*, the functions of a respiratory organ; or, on the other hand, it must be allowed that if in all the mollusks the cervical sac does not serve for respiration, neither does it perform this function in the *Patellæ*.

'There is a curious genus named *Patelloïda*, by MM. Quoy et Gaimard. In these mollusks the shell is absolutely like that of the *Patellæ*, and the animal has not only a cervical sac, but, moreover, a pectinated branchia on the right and anterior side of the body; and, what is remarkable, it is deprived of those vascular leaflets disposed around the foot in the *Patellæ*. The abolition of these leaflets, as soon as a true pectinated branchia is developed, while the cervical sac undergoes no alteration, and remains the same in both genera, affords, by a rational induction, the strongest presumption for believing that the leaflets of the *Patellæ* are, in fact, respiratory organs. These two methods of induction of which we have spoken would of themselves be sufficient to combat victoriously the opinion of M. de Blainville; but there is a third method still more preferable, that which anatomical investigation furnishes. When by a minute dissection we have [illegible] cipal branches of the vessels, [illegible] find constantly i[illegible] thickness of the muscles of the [illegible] parts of the large vessels which reach along the whole circu[illegible] and [illegible] a strong branch to each membranous le[illegible] Thi[illegible]tion is like that which is seen in the Chitons. The [illegible] which in the *Patellæ* are given off to the cervical [illegible] very small, [illegible] not to be compared with the development of those of [illegible] *Helices*, the *Limaces*, or even of the *Terebratulæ* and *Orbiculæ*, whose respiratory organ, though framed for breathing water only, is formed of a vascular net-work on a flattened membrane. In the *Patellæ*, the cervical vessels are not more developed than in the other mollusks, which, possessing a pectinated branchia, have also a cervical sac. It seems to us that we may conclude from the preceding observations that, in the *Patellæ*, the cervical sac is not branchial, and that the branchiæ consist of the floating lamellæ between the borders of the foot and of the mantle. By a natural consequence then, it becomes necessary to reject the opinion of M. de Blainville, and to place the *Patellæ* near the Chitons, forming a small family for each of these genera.'

We have only to add, that recent observations leave no doubt, if any could have existed after the luminous remarks of Deshayes, that Cuvier and his followers were right and that M. de Blai[illegible] wrong. The series of simple laminæ attached within [illegible]cular border of the mantle fulfil the office of *branchiæ*, and to that end are endowed with *cilia*, which keep up a perpetual current of sea water over them. This current flows from the outer to the inner edge over the surface of each branchial lamina. The position of Patella, therefore, among the *Cyclobranches* (eighth order of Gastropods), where it was placed by Cuvier before this character of the gills of gastropodous mollusks was known as it is now, ought not to be disturbed, and forms one, among many instances, of the penetrating character of Cuvier's mind.

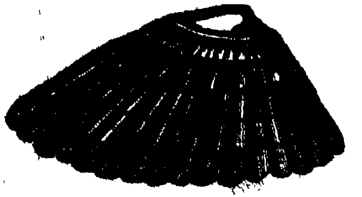
The following is De Blainville's arrangement of the species; and, in the present state of our knowledge of the genus, is perhaps as good as any that has been proposed.

α. Species whose summit is obtuse, vertical, very nearly mesial, and which are conical.—Example, *Patella vulgata.* Locality, the coasts of European seas, common in the channel.—N. B. Varieties almost endless.



[Patella vulgata.]

β. Species a little less conical, and whose summit is placed a little anterior to the position of the last, with a slight inclination forwards.—Example, *Patella deaurata.* Locality, Straits of Magelhaens, Falkland Isles, &c.

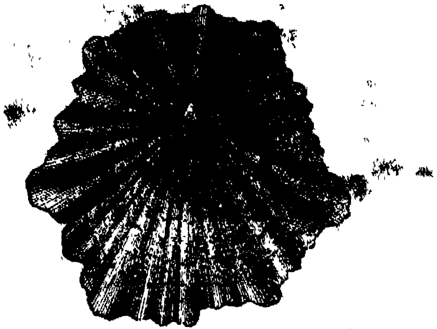


[Patella deaurata.]

γ. Species which are oval, elongated, and compressed at the sides.—Example, *Patella compressa.* Locality, Indian Seas, Lam.

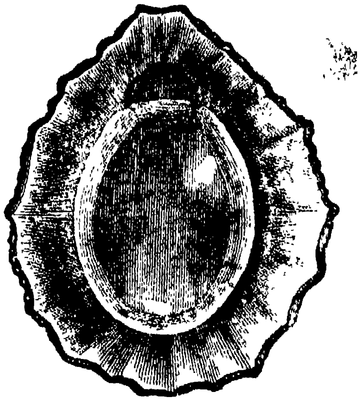
[Patella compressa.]*

Spe[illegible]ose summit is sub-anterior and very little developed, [illegible] which are entirely flat or depressed.—Example, *Patella scutellaris.*



[Patella scutellaris.]

ε. Depressed species, whose summit is scarcely indicated, and which are much narrower before than they are behind.—Example, *Patella cochlearia* (*Cochlear*). Genus, *Helcion*, De Montfort.



[Patella cochlearia.]

ζ. Oval species, with a well marked summit, evidently inclined forward and sub-marginal; border a little convex in the middle.—Example, *Patella pectinata.* Locality, the Mediterranean sea.

[Patella pectinata.]

η. Species which are oval, delicate, nacreous, and with a festooned border; the summit still more marginal and distinct.—Example, *Patella cymbularia.*

[Patella cymbularia.]

Geographical distribution.—The *Patellæ* are very widely spread, and few seas are without them. None however appear to have been observed in the Arctic seas, either by Captain Parry (1819) or Captain Ross. The larger species are found principally in warm climates.

Habits, &c.—This genus is one of those which has the power of absorbing the shells of other mollusks or rocks, and thus forming cavities or depressions on them. 'The *Patella cochlea*[1],' says Mr. Gray, in his interesting paper on the economy of molluscous animals (*Phil. Trans.*, 1833), 'is often found at the Cape of Good Hope, where it lives almost exclusively, attached to a large species of the same genus, on the surface of which it forms a flat disk, exactly the size of its mouth. To form these flat disks (of which there are so generally two, one on each side of the apex of the larger *Patella*, as almost to form a character [illegible] cies), and to assist in the increase of its size, the animal appears also to absorb the coralline, or other similar substances with which the larger shells are abundantly covered. The common *Patella* of our own coast, when long adherent to another shell of its own species, to chalk, or to old red sandstone or limestone, also forms for itself a deep cavity of the same form as its shell, and evidently produced by the dissolution of the surface to which it is affixed. These observations will strike every one who may take an interest in such subjects, and has opportunities of examination.

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* But see post, p. 442.

[1] Cochlo[illegible]

The species are numerous, [illegible] think it highly probable that many of these will prove to be mere varieties when the subject comes to be deeply investigated. The following remarks on the subject by Mr. G. B. Sowerby and Mr. Gray will be read with interest, and we could add to them from our own observation: 'Patella,' writes Mr. G. B. Sowerby (Genera of Shells), 'when detached from all the other genera which were associated with it under that name by Linnæan authors, forms still a genus very comprehensive in numbers; and though well characterised as a genus, the study of it is rendered extremely difficult, on account of the variations to which the species are liable from peculiarity of position or situation. This observation is suggested by the fact, that the *P. cœrulea* is extremely regular and thin when it has lived upon the leaves and stems of sea-weed; and, on the contrary, irregular when attached to the roots. We have also reason to believe that a like difference of situation is the cause of the great difference in character between *P. compressa* and *P. miniata;* but we are confident that they ought to be considered as varieties of the same, for we possess specimens in which, from the vertex to about half an inch from the margin, the characters are those of *P. compressa*, while the remainder of the same identical specimen is indisputably a well characterised *P. miniata;* it is remarkable that Lamarck should have observed the same fact, but considers it in some measure inexplicable.' Mr. Gray, in the memoir above quoted, thus contributes to this branch of the subject: 'When a *Patella* or a *Crepidula* has attached itself to the flat surface of a rock or the leaf of a large *fucus*, the base of its shell is flat and its mouth roundish; when it adheres to a concave surface, such as the cavity of an old shell, the base becomes flattened and convex internally; and when it fixes itself on the round stalk of a *fucus*, the sides become compressed so as in some measure to clasp the stem, and the lateral portions of the base project beyond the front and hinder parts to such an extent, that when placed on a flat surface it rocks backwards and forwards. Several nominal species of these and allied genera depend on variations in the shape of the shell, caused by the adhesion of the animal to surfaces of different forms; thus the *Patella pellucida* of Montagu is synonymous with the *P. cœrulea* of the same author, the former having been founded on specimens taken from the stalk, and the latter on individuals obtained from the flattened frond of the *fucus*, on which the species usually takes up its abode: it is indeed by no means rare to find specimens in which the animal has moved from one of these positions to the other, and in such cases the shell represents *P. cœrulea* and the base *P. pellucida*, or *vice versâ*. The same change takes place with regard to *P. miniata* and *P. compressa*. I have in my collection a specimen of this latter shell, which is *P. miniata* at the top, it having in its youth lived on the frond of a large Cape *fucus*; it afterwards removed to the stem and became compressed, and consequently is in this part the *P. compressa*, but by some accident it was again induced to change its situation, and removing to a flat surface, the edge of the mouth expanded, and it became a second time *P. miniata*, or perhaps what may be called by some authors *P. saccharina*, as this also appears to be a [illegible] variety of the same species. Lamarck has described a similar specimen; and Mr. Sowerby, in his Genera of Shells, has figured an example of this species, showing the two states. In like manner the *Crepidula* [illegible]*celiana*, when applied to a flat surface, has an expanded base and a flattened inner lip; but when adherent to a convex body, such as the stem of a sea-weed, or (as frequently happens) to the back of another shell of the same species, the animal being pressed into the cavity, the inner lip becomes concave, and the sides of the aperture are contracted; in this state the shell is called by some [illegible] *P. fornicata*.

When the shells of this family are adherent to irregular surfaces, they adapt their margins to the irregular [illegible] which they meet. I have several specimens from [illegible] of Devonshire, having one or more processes on their sides, which fitted into holes in the rock to which I found them attached; and such changes are the more remarkable, as some spec[illegible] are seen constantly moving from place to place, wh[illegible]hers appear to remain for a long time fixed in one spot; and even those that are thus stationary in the young state constantly elevate the margins of their shells when the tide is low. I have also a specimen of *Siphonaria gigas*, exhibiting in a great degree a similar adaptation of its edges to the form of the rock on which it grew.'

Patella has been found principally on rocky coasts, stones, and shells, at a depth ranging from the surface to thirty fathoms.

Food.—*Fuci* and other sea-weeds, in the separation and comminution of which their rasp-like tongues are probably highly active.

Before we proceed to the consideration of the fossil *Patellæ*, it may be expected that we should say a word of the allied genera, as far as shape of shell goes, *Siphonaria*, and *Patelloida*. These differ strongly in their organization from *Patella*, for instead of having a circle of branchial laminæ like that genus, they have a single pectinated branchia on the right side. To these Mr. Gray adds the genus *Lottia*, which, as he (loc. cit.) observes, 'must be extremely perplexing to those systematists who attend only to the form of the shell without paying any regard to its animal inhabitant. The shells of *Patella* and *Lottia* do not in the least differ in external form, and yet their animals belong to very different orders, the one having the branchiæ placed round the foot, as in the chitons, and the other having them placed on the side of the neck, like the *Fissurellæ*, from which indeed it chiefly differs in having only one branchia.' This description, by the way, accords with the genus *Patelloida* of Quoy and Gaimard. [PATELLOIDEA.]

The genus *Scutella*, brought home by Mr. Cuming from the Pacific Ocean, and described by Mr. Broderip in the 'Proceedings of the Zoological Society for 1834,' part 2, should here be mentioned. There is no doubt that the animal is marine; but unfortunately none of the soft parts were found, though the shells were in very fine condition; and, as we have seen, it is difficult in their absence to fix the precise place of the shell.

Generic Character.—Shell ancyliform, shining within. Apex posterior, central, involute. Muscular impressions two, oblong-ovate, lateral. Aperture large, ovate.

This genus, according to Broderip, appears to be intermediate between *Ancylus* and *Patella*, while the aspect of the back sometimes reminds the observer of *Navicella* or *Crepidula*. Its place, he observes, will most probably be among the *Cyclobranches* of Cuvier. The two muscular impressions are situated on each side of the interior, a little below the summit; while in *Patella* they nearly surround the internal circumference of the same part of the shell. The aperture is generally surrounded by a margin: and the apex, which in *Ancylus* is oblique, is central though posterior.

FOSSIL PATELLÆ.

Deshayes, in his Tables, gives 104 living species and 10 fossil (tertiary); one fossil species, *Patella equalis*, now living in the European ocean, in the English crag (pliocene period of Lyell), two at Dax and one at Valognes. G. Sowerby says that the fossil species are not numerous, and that they occur in the great oolite, in the lias, and, perhaps in the Oxford clay and chalk marl of the secondary series; in the calcaire grossier, and probably in the London clay of the tertiary series; and also in the crag of the diluvian formation. De la Bèche gives the following as being found among the organic remains in blue marls of the south of France: *Patella* [illegible] Lam.; *P. Bonardii*, Payrandeau (analogous to the existing species), also in the calcaire moellon; *P. umbella*, Lam. (also an analogue), and also in the calcaire moellon; *P. glabra*, Deshayes, Paris. Among the organic remains of the cretaceous group he enumerates *P. ovalis*, Nils. from Balsberg, Scania; an undetermined species from the lower green sand of Sussex, Mantell, and another from the lower green sand of Wilts, Lonsdale. In the oolitic group he places *P. latissima*, Sow. Oxford clay, Yorks. and mid. and S. of England; *P. rugosa*, Sow. forest marble, mid. and S. of England and Normandy; [illegible] Sow. lias, mid. and S. of Eng land; P. [illegible], Sow. Stonesfield slate; P. ancyloides, Sow. great oolite, Ancliff, Wilts; P. [illegible], Sow. same locality; P. discoides, Schlot. lias, Gundershofen; and P. papyracea, Goldf. lias, Banz. The grauwacke group, according to the same author, affords P. Neptuni, Goldf. Eifel, Olpe; P. primigena, Goldf. Pfaffrath; P.? conica, Wahl. Kinnekulle, Westrogothia; P.? pennicostis, Wahl. Ulanda, Westrogothia; P.? concentrica, Wahl. Mosseberg, &c. Westrogothia; and an undetermined species, Keswick, and near Kirby Lonsdale, Phil.

But the fossil zoologist will do well carefully to examine many of these so called species. Some of them are marked with a ? by the authors, and we have seen how liable to deception those who build upon the shape and structure of the shell alone are, even when examining the shells of recent species. The examples above given of mollusks with shells nearly identical, but of very different organization, should be borne in mind by the geologist, when he would draw conclusions as to the age, condition, or formation of a stratum, from the shells contained therein.

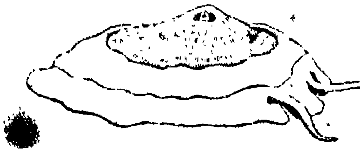
Family 2. *Branchifera.*

Organs of respiration, two large equal pectinated branchiæ.

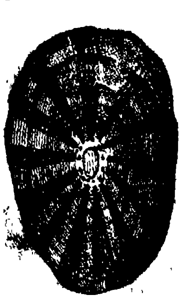
Genus, *Fissurella.*

The *Fissurellæ*, which Cuvier places among the *Scutibranches*, his seventh order of Gastropods, have a large fleshy disk or foot beneath the belly, like the *Patellæ*, and a conical shell fixed upon the middle of the back, but not always entirely covering it, for this shell is pierced at its summit with a small aperture, generally oval, which, according to Cuvier, serves at the same time as a passage for the water necessary to respiration and as an outlet for the excrements. This aperture penetrates into the cavity of the branchiæ situated on the fore part of the back, and in the bottom of which the vent discharges itself. This cavity is, besides, widely opened above the head. There is on each side, symmetrically disposed, a pectinated branchia or gill. The tentacula are conical, at the external bases of which the eyes are situated. The sides of the foot are fringed with filaments. Mr. Gray, in the memoir above quoted, says, 'In the young state of the *Fissurellæ*, the hole by which the fæces pass out of the shell is placed a little in front of its recurved and spiral apex: in this state it has been formed into a genus under the names of *Rimula* and *Puncturella*. But as the animal grows, the hole enlarges in size backwards, and the true apex being absorbed, the hole appears in the adult shell to be placed on the tip, and in some species even to extend behind it.'

The muscular impression is in the form of a horseshoe, with the opening in front.



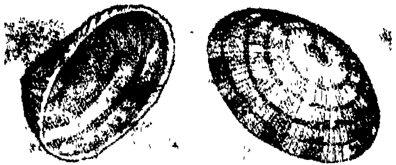
[Animal of Fissurella.]



[Shell of Fissurella.]

De Blainville thus arranges the genus:

Species which have the middle part of the borders of the opening excavated as it were, so that when placed upon a flat surface, they only touch it at their extremities.—Example, *Fissurella nimbosa.*



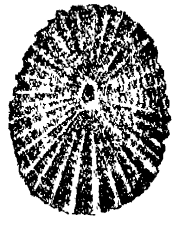
[Fissurella nimbosa.]

Deshayes observes that the synonymy of this species has been very faulty from the time of Linnæus downwards; and he remarks that three species are confounded under *Patella nimbosa* in the twelfth edition of the 'Systema Naturæ.' Deshayes adds that the species was named in Lamarck's collection, and that he has seen it, and therefore knows what Lamarck meant by his *Fissurella nimbosa.* The figure from which our cut is taken, that of Martini, I., t. xi., f. 91-92, is one of those references which Deshayes would leave untouched as indicating the species.

β. Species more depressed, &c., so that when placed upon a flat surface, the extremities are raised, forming a kind of canal.—Example, *Fissurella rosea.* Locality, Guiana, &c.

[Fissurella rosea.]

Conical species with horizontal borders.—Example, *Fissurella Græca.* Locality, Mediterranean and Atlantic.



[Fissurella Græca.]

Geographical Distribution, Habits, &c.—Much the same as those of *Patella.* Like that genus *Fissurella* is littoral, and has been found at depths ranging from the surface to twenty-five fathoms.

Fossil Fissurellæ.

G. B. Sowerby says that a few fossil species are found in the truly marine formations above the chalk. Deshayes, in his Tables, enumerates 33 living species and 8 fossil (tertiary).[*] Of these, *Fissurellæ Græca, costaria,* and *neglecta,* he states to be both living (the two former in the European and Indian oceans, and the latter in the Mediterranean) and fossil, in the pliocene (all three), and miocene (the two latter) periods of Lyell, (Sicily, Italy in the sub-Apennine beds, English crag, and Touraine). He mentions three Sicilian species, three Italian (sub-Apennine beds), one in the English crag, two at Dax, two in Touraine, two at Angers, and four at Paris.[†] The *Fissurella Noachina* of Deshayes, *Patella Noachina* of Lyell, is living in the Northern Seas, and found fossil in Sweden and Norway. It appears to be between a *Fissurella* and an *Emarginula*, and it is not impossible that it may be a *Fissurella* in a young state.

Genera, Emarginula.
Parmophorus.

Cuvier observes that the *Emarginulæ* have exactly the same structure as the *Fissurellæ*, with this exception, that the former, instead of the aperture at the apex of the shell, have in their mantle and shell a small slit or notch at their anterior border, which opens into the branchial cavity. The borders of the mantle envelop and cover a great portion of those of the shell.

The eyes are situated upon a tubercle at the external bases of the conical tentacula. The edges of the foot are furnished with a row of filaments. G. B. Sowerby observes that 'the animal of the *Fissurella* is very nearly related to that of *Emarginula*, as the shell is to the *Emarginula* itself; the fissure in the anterior margin of the latter serving for the same purposes as the perforation in the vertex of the former. One difference however is peculiarly observable, which is that in *Emarginula* the vertex is directed posteriorly, contrariwise to that of *Fissurella*; for Lamarck is mistaken in speaking of the notch or fissure in the edge of *Emarginula* as posterior.' Of *Parmophorus* ier says that, like the *Emarginulæ*, its shell is covered a considerable portion by the turned-up edges of the mantle; this shell he describes as oblong, slightly conical, and without hole or notch. The *branchiæ* and the rest of the organs are the same as they are in the two preceding genera. G. B. Sowerby thus writes upon this point (Genera of Shells):—'*Emarginula* is more nearly related to *Fissurella* than to *Patella*, inasmuch as its *branchiæ* are not external, and the little fissure or notch in the anterior edge is only the termination of a narrow canal, that serves the same purpose in this shell as the perforation in the summit of *Fissurella*. It is observable that Lamarck has placed *Emarginula* next to *Parmophorus*, without seeming to have remarked the very great resemblance of the animals to each other; we have thought ourselves justified, both by the characters of the shells and of the animals, in uniting them; this may be objected to perhaps on account of the great difference in general form; but we answer that there are some species of Lamarckian *Emarginulæ*, one of which we have figured, which approach very nearly to Blainville's *Parmophorus* in shape. Another objection may arise from the apparent want of the anterior fissure in *Parmophorus*, but it will be seen that the anterior edge of the shell is always somewhat emarginate, while in the situation of the *branchiæ*, the anterior fissure in the mantle of the animal, and in the position of the vertex in the shell, they exactly resemble each other; we therefore consider the *Parmophori* of Blainville and Lamarck as elongated and compressed *Emarginulæ*.' Deshayes, in his edition of Lamarck (1836), thus expresses his opinion:—'Cuvier was the first who gave anatomical details of the genus *Emarginula*, and he made it appear how much analogy existed between it and *Fissurella*. There exists, nevertheless, between these two genera sufficient differences to warrant their continuance in systematic arrangement. But it is not so with regard to *Parmophorus*. M. de Blainville, to whom we owe this last genus, and who was the first to make the animal known, had judiciously preconceived the necessity of its junction with *Emarginula*. In fact, not only have the animals of the two genera a perfect analogy, and not only can they be with difficulty distinguished in some cases and in some species, but the shells themselves, as might have been supposed *à priori*, offer some passages from the one genus to the other, the number of which will be augmented by new researches. When we have before us a fairly complete series of living and fossil species belonging to the two genera, the following observations occur:—The two fossil species of *Parmophorus* have no trace of a marginal notch; *Parmophorus Australis* has the anterior border a little depressed in the middle, and within the shell is to be seen, corresponding with this depression, a small crest indicating the separation of the mantle. Among the species of *Emarginulæ* brought home by MM. Quoy and Gaimard there is one which they name *Parmophoïda*, and which would seem to be entirely deprived of a marginal notch. In the *Subemarginulæ* of M. de Blainville, the shells have no longer this notch, but they have within a deep ridge (*sillon*) in the place of it. In other species, as in *Emarginula rubra* of Lamarck and *E. elegans* of M. Defrance, the small interior ridge is terminated on the border by a very short notch, and from this commencement to the termination of the series of species we see this notch become deeper and deeper, and change at last into a deep slit, occupying one half of the height of the shell.' After dwelling upon the differences of the shells in other points of external form, M. Deshayes observes that the general aspect [illegible] shells leads the zoologist to separate the genera, while the structure of the animals tends to fuse them into one, and thus concludes—'M. Sowerby has come, as we have before said, to this conclusion, and in his "Genera of Shells" has united the *Parmophori* to the *Emarginula*. This example will without doubt be followed are [illegible] zoologists.'

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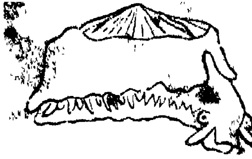
[*] Mr. G. B. Sowerby, in the Second Part of the Proceedings of the Zoological Society for 1834, describes 27 new species brought home by Mr. Cuming. Two others are also there recorded, making 29 additional species.

[†] The bracket that gives off these numbers includes *Emarginula.*

tirely agree in this conclusion, and consider the following arrangement of De Blainville's ary, and calculated to assist the con zoologist in his subdivision of this mollu

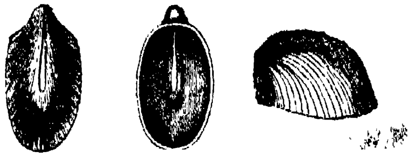
Emarginula.



[Animal of Emarginula.]

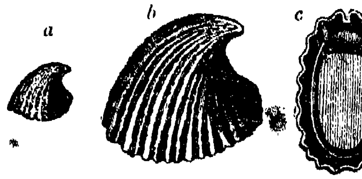
[Shell of Emarginula (E. conica).]

α. Species whose notch is in the middle of the back of the shell, and far from reaching the edge. (*Rimula?* or *Rimulaire?* of Defrance).—Example, *Emarginula Blainvillii.*



[Emarginula Blainvillii.]

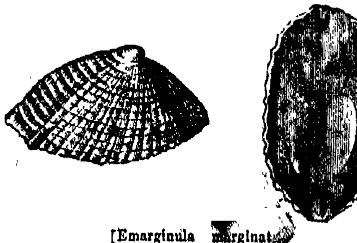
β. Compressed species, whose anterior border is deeply notched, and the summit strongly marked (*Les Entailles*).—Example, *Emarginula Fissura.*



[Emarginula Fissura.]

a, natural size; b, magnified; c, magnified, the shell turned up, showing the animal in situ.

. Species still more compressed, whose anterior border is only bent into a gutter, and whose summit is still evident (*Subemarginulæ*).—Example, *Emarginula Emarginata.*



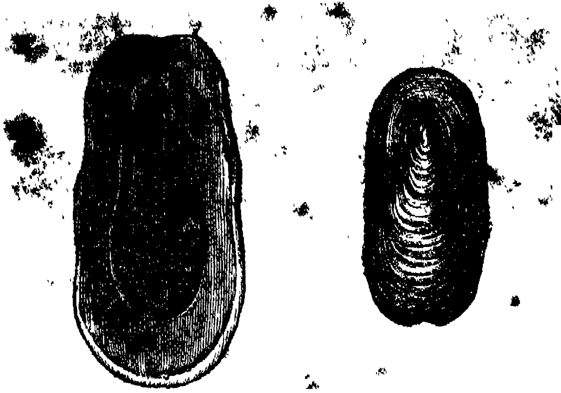
[Emarginula marginata.]

δ. Species very much depressed; the summit very little developed and præmedian, with a small notch.—Example, *Emarginula depressa.*

[Emarginula depressa.]

Parmophorus (*Scutum* of De Mo[illegible]).

Example, *Parmophorus Australis*; *S[illegible]elongatus. Patella ambigua*, Linn.; Localities, Seas of New Holland and New Zealand.



[Parmophorus Australis.]

Habits, &c.—Emarginula and *Parmophorus* are littoral shells like patella, and their habits are similar to those of the last-named genus. *Emarginula* has been found at depths ranging from the surface to eleven fathoms.

Fossil Emarginulæ and Parmophori.

G. B. Sowerby, 'Genera of Recent and Fossil Shells,' observes that the fossil *Emarginulæ* are scarce. 'They occur,' adds that author, 'in the *calcaire grossier* and its contemporary strata; in the crag of Suffolk, Essex, and Norfolk; and in the Bath oolite. They are very elegant little fossils, particularly Lamarck's *E. clypeata*. We cannot consider his *Parmophorus elongatus* as a species of this genus, for its vertex is anterior, as its muscular impression demonstrates; consequently we find in it no mark of a canal at either end; it must therefore be classed with *Patella*.'

Emarginula.—Deshayes, in his tables, gives seven living species and eleven fossil (tertiary), one *E. fissura*, an inhabitant of the European and Mediterranean Seas, fossil in the crag at Bordeaux and Dax, and at Paris (Pliocene, Miocene, and Eocene periods of Lyell). De la Bèche enumerates two in the blue marls of the South of France, namely, one closely approaching *E. fissura* of Lamarck and *E. reticulata* of Sowerby. In the cretaceous group he gives two, *E. Sanctæ Catherinæ* and *E. pelagica*, both from Rouen. In the oolitic group he records one species, *E. scalaris*, Sowerby, from the great oolite at Ancliff, Wilts. Deshayes, in his edition of Lamarck (1836), enumerates eleven living species, and five found only in the fossil state, namely, *E. costata* and *E. clypeata*, Lamarck, from Grignon; *E. radiola*, Lamarck, from Parnes; and *E. elegans* and *E. clathrata*, Deshayes, the first from Paris and Valognes, and the other, a rare species, from Parnes.

Parmophorus.—Deshayes, in his tables, gives two living and two fossil species (tertiary), one from Touraine (Miocene period of Lyell); and he enumerates two from the Crag, three from Touraine, three from Angers, five from Paris, two from Valognes. In his edition of Lamarck, he notes two species only as fossil, one *P. elongatus*, Lamarck, with a variety, from Grignon, and the other *P. angustus*, Deshayes, from Paris.

CERVUS. [Deer.]

CESAROTTI, MELCHIORRE, born at Padua in May, 1730, studied in the seminary of that city, and showed from his early youth a great taste for learning, and especially for philological studies. In 1762 he was appointed preceptor of the children of the patrician Grimani at Venice, where he became acquainted with Mr. Sackville, who informed him of the appearance of Ossian's poems recently published by Macpherson. Cesarotti was so struck by their peculiarity and the novelty of the style, that he resolved on translating Ossian into Italian blank verse, which he effected with the assistance of Sackville. He dedicated his translation to the Earl of Bute, who caused an elegant edition of it to be printed at his own expense at Padua, 2 vols., 8vo., 1763, and made a present of it to the author. Without discussing the merit of these poems, it is but just to say that Cesarotti's translation is a fine specimen of Italian versification, being harmonious and fluent, and in many parts highly poetical. He broke through the tameness into which Italian poetry had sunk for more than a century before him, and gave the example of a new style and a bolder flight of imagination. Cesarotti however was not of a mind likely to be restrained within rational bounds. His bio- observes that, like the son of a miser, who to the opposite extreme of prodigality, Cesa- born in a country that stationary in learning, and at up among writers tame and timid in their investi- s, seems to have determined on breaking through all the boundaries of language, taste, and composition, and attempting to effect a complete revolution in literature. His language is full of neologisms, and he had the hardihood to assert his preference of Ossian's poems to those of Ho He attempted a version, or, as he called it, a reform Iliad, which he styled 'La Morte di Ettore,' in whic took such liberties with his text, that it may be considered as a parody rather than a translation. A caricature appeared at Rome, representing the head of Homer placed on the shoulders of a French dandy, with the legend 'Translation of Homer.' Cesarotti wrote some preliminary dissertations illustrative of the same poem, in which he displays much erudition and sounder criticism than in his version. His 'Saggio della Filosofia delle Lingue applicata alla Lingua Italiana,' Padua, 1785, is perhaps his best critical and philosophical work. He contends for the necessity of the written language keeping pace with the progress of ideas, inventions, discoveries, and new wants and habits. The academy of La Crusca was half inclined at one time to agree with the author, but veneration for purism and precedent prevailed among the members of that learned body. Count Galeani Napione wrote, chiefly in reply to Cesarotti, his work, 'Dell' Uso e dei Pregi della Lingua Italiana,' to which Cesarotti answered by his 'Rischiarimenti Apologetici sopra alcune Teorie Preliminari, o sul Francesismo.' The whole of this controversy may prove interesting to those who wish to form a clear idea of the disputes concerning language, which have formed a considerable portion of the Italian literature of our age. Cesarotti was appointed by the Venetian senate to the chair of Greek and Hebrew in the university of Padua. In his quality of secretary to the academy of Padua, he wrote, from 1730 till 1798, 'Relazioni Accademiche,' in which he gave at the end of every year an abstract of the memoirs read by the members of that body; and also 'Elogi di alcune Academici,' among which the most interesting is that of Abate Oliva, the author of the 'Zoologia Adriatica.' The 'Epistolario,' or voluminous correspondence of Cesarotti, was published in 6 vols., 8vo., Florence, 1811. In 1807 Cesarotti went to Milan, to deprecate the wrath of Napoleon against his countrymen of Padua, who had shown some disposition to resist the conqueror. Napoleon, who was a great admirer of Cesarotti's Ossian, received him in a very friendly manner, made him a knight of the iron crown, and bestowed a pension upon him. Cesarotti in return set about writing the praises of his patron in a poetical composition, which he styled 'Pronea,' the object of which is to show that Napoleon was the envoy of Providence. The composition is cold, full of allegories and metaphysical abstractions, and the style is turgid. The 'Pronea' was a still-born work, and its name is now only remembered among the many specimens of the flattery and servility of the Italian literary men in Napoleon's time.

Cesarotti died on November 4, 1808. His private character was simple and amiable; he was a man of regular habits, indefatigable in his studies, courteous to his visitors, friendly to those about him, and much beloved by his pupils. He translated several orations of Demosthenes, Isocrates, Æschines, Lysias, and other Greek writers, and also Juvenal. His essays and dissertations are numerous. His works were collected and published in 42 vols. 8vo., Pisa, 1809; the editors of the 'Classici Italiani' published a selection of them in 4 vols. 8vo., Milan, 1820.

CESSION. When an ecclesiastical person accepts a second benefice or dignity in the church, which is incompatible by law with that which he previously held, the latter is said to be void by cession. This avoidance takes place *ipso facto* upon the acceptance of the second benefice; and the patron may at once, without any sentence of deprivation in the spiritual court, and without any express resignation, present a new incumbent, and require his admission. By the statute 21 Hen. VIII. c. 13, sect. 9, if a person, possessed of a benefice with cure of souls of the yearly value of 8*l*. or above, accept and take any other benefice with cure of souls, without a dispensation to hold both, the first is declared to be wholly void in law. But even if the first benefice be under the value of 8*l*., and for that reason not within the statutory provision, it becomes void by the canon law as against the patron, in consequence of the acceptance by the incumbent of a second benefice or dignity. (Watson's *Clergyman's Law*, cap. 2; Burn's *Ecclesi[illegible]cal Law*, tit. 'Avoidance and lapse.')

CESTUM. [Ciliograda.]

CETA'CEA. [Whales.]

CETIC ACID, a substance obtained by Chevreul from spermaceti, and to which he has since given the name of *ethal* [Ethal].

CETINE is the name proposed by Chevreul for the crystallizable matter which forms the greater part of the substance called spermaceti. In order to obtain it pure, the spermaceti must be treated with boiling alcohol, and the clear solution, on cooling, deposits cetine, which, if requisite, is to be purified by a second solution in, and deposition from, alcohol.

Cetine is white, crystalline, soft to the touch, and friable; it is nearly inodorous, is tasteless, and does not act upon litmus: it fuses at 120° Fahr. When distilled in vacuo, it is volatilized without change; but when heated in a retort in the usual way, it yields a small quantity of acid and of oil, and a large proportion of solid crystalline product, traces of charcoal remaining in the retort. One hundred parts of boiling anhydrous alcohol dissolve 15·8 of cetine; but when its specific gravity is ·834, only three parts are dissolved. If one part of cetine, an equal weight of hydrate of potash, and two parts of water are digested at a temperature between 122° and 194° Fahr. for several days, a soap is formed which is different from other soaps, containing margarate and oleate of potash, combined with an unsaponified fatty matter, which Chevreul calls *ethal*. [Ethal.] When this soap is decomposed by an acid, the ethal is separated with the margaric and oleic acids; 100 parts of cetine thus treated, give 60·96 parts of these acids, and 40·64 of ethal, the increase of weight amounting to 1·6. According to Chevreul, cetine consists of—

Carbon . .	81·660
Hydrogen . .	12·862
Oxygen . .	4·578

CE'TOCIS, De Montfort's generic name for those Belemnites which are plicated at the summits.

CETONI'ADÆ (Mac Leay), a family of Coleopterous insects, of the section Melitophili (Latreille). The species belonging to this family have the sternum more or less prolonged into an obtuse point, between the second pair of legs: the mentum is emarginated, and never transverse: the terminal lobe of the maxillæ is furnished with a tuft of fine hairs; the labrum is concealed: the antennæ are small and ten-jointed; the basal joints are short; the three terminal joints are comparatively large, placed close together, and form a triphyllous knob. The thorax is generally somewhat triangular, with the anterior part (which would form the apex of the triangle) truncated. The elytra are usually rather straight at the sides, and obtusely rounded at the apex, thus presenting a somewhat square form: their disc is rather flat. A triangular scale is interposed between the base of the thorax and that of the elytra at their outer angles.

The Cetoniadæ form one of the most extensive groups of the beetle tribe, and nothing can exceed the brilliant colours with which many of them are adorned—in this respect vyeing with, if not surpassing, the Buprestidæ.

In the larva and imago states these insects feed upon vegetable substances: the grub or larva of the common rose-beetle very much resembles that of the cockchafer,[†] and when about to assume the pupa state, encloses itself in a cocoon formed of particles of earth and rotten wood, or any surrounding substances, fastened together by means of a glutinous secretion.

In viewing a large collection of insects of this family, it is difficult to say what colours prevail most. In *Cetonia*, the typical genus of the group (in which the scutellum is of moderate size), the colours are generally burnished, and consist for the most part of various shades of green. Cetonia Aurata (the common rose-beetle) affords a good example of this genus; it is about three-quarters of an inch in length, and of a [illegible] and sometimes copper-like colour, with two [illegible]ite irregular fasciæ towards the latter part of the elytra, and extending from the side inwards: these fasciæ (and several little spots of the same colour which are observable on the elytra) are composed of a number of small scales, which, in old [illegible]s, are often nearly all rubbed off. This species is [illegible] known to require further description: it is seen very commonly in the south of England flying about in the sunshine during the months of May and June, frequently settling on roses, the leav[illegible] of which it greedily devours: it is also very fond of [illegible] and lilac flowers. If perchance the bark of a tree [illegible] that the [illegible], this insect w[illegible] licking it up, and collecting it by means of the tufts of hair with which the maxillæ are terminated.

Rösel informs us that he kept one of these insects alive for upwards of three years, during which time he fed it upon fruit and moist white bread.

Cetonia stictica, a small species, about half an inch in length, and of a black colour, with numerous white spots on the thorax and elytra, is said to have been taken at large in this country; its occurrence is however so rare, that it is doubted by some if it be truly indigenous. It is common in France and Germany, and is found on thistles.

C. fastuosa, a species which somewhat resembles the one first described, but is of a larger size, and without any spots, occurs in the south of France.

CETOPIRA. [Cirrhipeda.]

CETTE, a town and port of France, in the department of Hérault, on a narrow tongue of land, which separates the étang or pool of Thau from the Mediterranean, in 43° 24′ N. lat. and 3° 42′ E. long.

Cette is a modern town; its rise was connected with the construction of the Great Canal of Languedoc, of which its port forms one embouchure. The canal passes by a very winding course from the immediate neighbourhood of the river Aude, by Béziers and Agde, into the étang de Thau, from which a canal is cut through the narrow tongue of land above mentioned into the Mediterranean; and the port is formed by two moles or piers which extend into the sea on each side of the mouth of this canal. Before the construction of the canal of Languedoc there was a small hamlet (still existing in the neighbourhood of the town), which had about a score inhabitants, and which bore the name of Sette or Cette, as did also a small promontory in the neighbourhood. The moles were completed in 1678, about two years before the completion of the canal of Languedoc; the principal mole runs E. & W. from the Cape of Cette, and has a battery and a lighthouse. The port is not very good, nor has it the natural facilities for becoming so; but its situation at the entrance of the canal, and on a coast which has very few harbours, keeps up the commercial importance of the place. It has canal communication by the Canal des Etangs, the étang de Mauguio, the Canal de Roubine, or de la Robine de Vic, with Aigues Mortes, St. Gilles, Beaucaire, and thus with the Rhône. In order to keep the sand from blocking up the port, the original moles have been lengthened; and an insulated mole constructed across the mouth of the haven.

The town was originally on the west side of the canal, from the étang de Thau to the sea, but has since extended so as to occupy both sides; the older or western part is built on the side of the calcareous eminence which forms the headland of Cette; the eastern part is built upon piles: the two parts are united by a bridge. The town and port present a very picturesque appearance.

The population of Cette in 1832 was 10,638. The refining of sugar was established here in 1717, by some merchants of Montpellier, and is still one of the branches of the trade of the town. Snuff and soap are also manufactured, and the salt works of the étang de Thau employ many hands. Besides these occupations, the inhabitants carry on a great trade in the wines and brandies of Languedoc, of which this town is the depôt, and they have considerable fisheries. The town is also frequented for its sea baths and sand baths. There are a marine school and a theatre.

Some writers contend that the name should be written Sette or even Sète. 'I conform to custom in writing Cette,' says M. Millin, 'but it seems to me preferable to write Sète. Festus Avienus names the mountain of Sète, *Setius Mons*. Ptolemy and Strabo have both known this mountain; the first calls it Σητιον ὄρος, the second Σιτιον. On the medal, referring to the construction of the port of Sète, we have these words for the inscription, "*Portus Setius*, 1666." In the explanation of this medal (*Médailles [illegible] is le Grand*, p. 91), the French name of the town [illegible]n in the same manner.' *Voyage dans les Dép. d[illegible] de la France.* See also Malte Brun, *Géographie Univ[illegible]*

CETUS, the sea-monster, called Pistrix by Hyginus, and Orphus by some of the Greeks, is said to represent the mon-star which is going to devour Andromeda. It is situated below Pisces and Aries, and a bright star in the head, called Menkar (α Ceti), comes on the meridian at eight o'clock in the beginning of January. It is usually drawn with a fish's head, two paws in front, and a curled fish's tail. The following is a list of stars:—

[†] See figur[illegible] Kirby and Spence's 'Introduction to British Entomology,' vol. iii. plate 17, fig. 12.

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed, Piazzi ( ), Bradley [ ].	Astron. Society.			Flamsteed, Piazzi ( ), Bradley [ ].	Astron. Society.	
(*g*)	2	2874	4½	(F)	67	238	6
(*p*)	3	2875	6	ο	68	243	2¾
	4	2879	6		69	244	6
	5	2880	6		70	245	6
(*f*)	6	11	6		71	250	6
(*h*)	7	15	5	ρ	72	252	4
ι	8	20	3	ξ²	73	255	4¾
	9	25	6	(*u*)	* 75	261	5½
	10	32	6	σ	76	263	4
(*n*)	12	47	6	(*e*¹)	77	266	6
	13	50	6	ν	78	269	4½
	15	57	7	(*e*²)	80	274	6
β	16	67	3	(*d*²)	81	275	6
φ¹	17	68	5	δ	82	278	3
	18	72	6	ε	83	280	3
φ²	19	85	6		84	281	6
(*m*)	20	86	6		85	286	6
φ³	22	95	5	γ	86	289	3
φ⁴	23	99	6	μ	87	293	4
	25	104	6	π	89	294	3¾
	26	105	6	λ	91	322	5
	27	109	6	α	92	332	2
	28	110	6	(*k*¹)	94	352	6
	30	114	6	(*k*²)	95	357	6
η	31	118	3	κ¹	96	360	5
	32	124	6	κ²	97	366	5½
	33	125	6		(1)	9	6½
	34	129	6		(4)	350	6½
	35	130	6		(52)	240	6
(*b*)	37	134	6		(57)	144	7
	38	136	6		(60)	26	6½
	39	137	6		(75)	248	6½
	40	138	6		(88)	36	6
(*l*¹)	42	141	6		(91)	38	6
(*l*²)	43	145	6		(113)	48	7
	44	148	6		(118)	265	6½
θ	45	149	3		(123)	268	6¼
(*c*)	46	152	5		(130)	55	6
	47	155	6		(1[illegible])	273	6¼
	48	163	6		(13[illegible])	179	6
	49	171	6		(146)	62	6½
	50	177	6		(148)	279	7
τ	52	188	3½		(152)	64	6
χ	53	194	5		(155)	66	6
	54	195	6		(166)	70	6
ζ	55	197	3		(167)	190	6
	56	208	6		(171)	71	6
(*t*)	57	216	6		(225)	214	7
υ	59	217	4½		(230)	92	6½
	60	223	6		(266)	230	6½
	63	234	6		(282)	1	7
	64	232	6		[191]	154	6½
ξ¹	65	237	6		[201]	164	6

CEULEN. [VAN CEULEN.]

CE'UTA, a town and fortress belonging to the Spaniards on the north coast of the kingdom of Fez, in the empire of Marocco, and at the entrance of the Straits of Gibraltar on the Mediterranean side, where a small peninsula, about three miles in length, juts out in a N.N.E. direction exactly opposite Gibraltar. The peninsula is joined to the mainland of Africa by a narrow isthmus, on which the town is built, and is well fortified on the land side against any attacks of the Moors. Outside or N.E. of the town the peninsula spreads out in a rounded shape, and is almost entirely occupied by a mountain called Almina and also Monte del Hacho, which forms part of the antient Abyla, and from which there is a fine view of the straits, the plains and mountains of the interior, and the opposite coast of Spain. The main group of Abyla lies W. and outside of the peninsula of Ceuta, and forms a promontory called Capo Leona by the Mediterranean sailors. The mountain itself is called by the Moors Jebel Zatut, or Mountain of the Monkeys. There are some gardens irrigated by springs of water, where the vine, orange, lemon, and other fruit-trees thrive. Provisions for the inhabitants and the garrison are chiefly brought in by sea, for little communication is kept up between the inhabitants and the Moors of the interior. Ceuta has a small and not safe harbour, and 9200 inhabitants, according to Miñano, exclusive of the garrison. There is a cathedral, and a bishop suffragan of Seville. The military commander is also political governor of the place, and has under him the other presidios or forts held by the Spaniards on the coast of Marocco, namely, Peñon de Velez, Alhucema, and Melilla, the latter of which is about 150 miles E. of Ceuta towards the frontiers of Algiers. There is a house of correction for criminals sent from Spain, who are employed in the public works. State-prisoners are also sent here. During the late frequent political revolutions and reactions in Spain, many individuals of all classes have been confined in Ceuta for years by the prevailing party. Ceuta, or Septa, was a town of Mauritania Tingitana under the Romans. John I., king of Portugal, took it from the Moors in 1415. It came under the dominion of Spain in 1580, when Philip II conquered Portugal. The Portuguese afterwards formally ceded it to Spain by the peace of Lisbon in 1668. In 1690 the Moors besieged it unsuccessfully. There is a good topographical drawing of the peninsula of Ceuta among the maps in the King's Library, British Museum.

CEUTORHY'NCHUS, a genus of coleopterous insects, of the family Curculionidæ (Leach). Technical characters:—antennæ eleven-jointed, seven of which compose the funiculus; the basal joint is as long as the remainder taken together; the club is ovate. Rostrum sometimes long, bent, and filiform, and at others short and straight. Thorax with the fore-part much attenuated, with a channel beneath, in which the snout may be deposited. Scutellan minute and hardly apparent; the elytra are rounded at the extremity, and do not entirely cover the abdomen; the extremity of the tibiæ is without spines.

The little insects of which this genus is composed are very numerous, and frequent plants of various sorts; some scarcely exceed a mustard seed in size. *C. didymus* is abundant on the common stinging nettle, and about the size of a hemp-seed. It is white beneath, and of a dull brownish black above; the sides of the thorax are white, and the elytra are furnished with two spots of the same colour; the apex of the elytra is also more or less white. When touched, or often when even approached, these little beetles close their snout in a groove on the under part of the body, contract the legs, and allow themselves to roll off the leaves to the ground, where they are with difficulty distinguished from the mould.

CEVADIC ACID, a peculiar acid obtained by Pelletier and Caventou from cevadilla, the seed of the veratrum sabadilla. When this is digested in æther, a fat oil, consisting of stearine and elaine, is dissolved; this oil, separated from the æther by distillation, is then saponified by potash; this soap is decomposed by tartaric acid; the fat acids, set free, are separated by the filter; and the solution being distilled, cevadic acid, mixed with much water, is condensed in the receiver: this is saturated with barytes, and the salt obtained by evaporation to dryness is mixed with phosphoric acid and distilled. The cevadic acid sublimes in white pearly needles which fuse at 67° Fahr., and exhale the same smell as butyric acid, or as rancid butter, which owes its smell to that acid. Cevadic acid sublimes at a few degrees above its melting point, and it is soluble in water, alcohol, and æther. Its salts are but little known, but they retain the smell of the acid; ammonia precipitates the persalts of iron white.

CEVADI'LLA, SEBADILLA, or SABADILLA, is the Spanish-Mexican name for a species of Veratrum, the seeds of which have become an article of considerable importance, in consequence of their having been found to contain a considerable quantity of Veratria. Much interest has been excited about this drug, from the obscurity that is supposed to hang about its origin. It has always been understood to come from [illegible] Retzius, who first referred the Cevadilla to Verat[illegible] had no better mate-

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* Erroneously called ν¹ by Flamsteed.

rials to describe it from than a bit of the inflorescence which he found among a sample of the seeds. Smith, under Veratrum (in 1819), traced out its synonyms in Rees's Cyclopædia, but without throwing much light upon [illegible]. Fée, in 1828, knew no more about it than what Retzius had stated, adding that the meaning of the word was *little oat*, *Cebadilla* being a diminution of *Cebada*, the Spanish for oats. He considered it was fit for use as a horse medicine and to destroy vermin. At a later period Descourtilz referred, in his Flore des [illegible]les, the Veratrum Sabadilla of Retzius to a West Indian [illegible]nt; and shortly after it was ascertained that there was also a Mexican Cevadilla, which corresponded entirely with the seeds of the shops. Thus again Mexico was fixed as the undoubted origin of that valuable production, in which the principle veratria is found more concentrated than in any known plant. Dr. Schiede discovered it in grassy places near the Hacienda de la Laguna in Barranca de Tioselo, on the eastern declivity of the Mexican table-[illegible] and it has been since described by Schlechtendahl and Chamisso, under the name of *Veratrum officinale*, in a paper of which the following is a translation. Root bulbous. Plant usually growing in tufts. Leaves linear, tapering to the point, even, quite smooth, entire, channelled on the upper side, keeled at the back, four feet long, rather weak. Scape naked, as high as a man, quite simple, terminated by a raceme a foot and a half long. Perianth deeply six-parted, spreading, yellowish, small, persistent, with thick blunt linear segments, of which three are rather broader than the others. Filaments six, somewhat club-shaped, yellowish, inserted into the base of the perianth, the three that are opposite to the broader segments rather longer than the others, and all longer than the perianth; anthers rather large, yellow, cordate at the base, obtuse; pollen yellow. Ovary superior, consisting of three carpels united by their sutures; styles very short. Fruit tricapsular, the capsules adhering by their suture but readily separated. Lower flowers hermaphrodite and fertile, upper, male and sterile on account of the abortion of the ovary. Flowers have the smell of the common Barberry. This plant produces the true Mexican Sabadilla, or Cevadilla. But in the shops there appear to be seeds of two distinct species, one of which is the *V. Sabadilla*, the other the plant now described, which differs in having linear, keeled, channelled, and not ribgrass-like leaves, yellow and not purple flowers, segments of the perianth linear and shorter than the filaments, and not ovate or lanceolate, and longer than the filaments. Nearly related to this is a *V. frigidum*, found in the Alpine regions of Orizaba, where it flowers in September; this has blackish brown flowers, and is reckoned a poisonous plant by the Mexicans, who call it *Sevoeja*. It would be worth inquiring whether the *V. angustifolium* of Pursh, a plant occurring in the mountainous parts of Virginia and Carolina, and in the low lands of Ohio, Tennessee, and Louisiana, does not possess similar properties. We strongly suspect that all these supposed Veratrums really belong rather to the genus Helonias, with the exception of *V. Sabadilla* itself, which seems to be a genuine species of the genus in which it stands.

CE'VENNES, a chain of mountains in the south of France, in Languedoc, forming the continuation of the mountains of the ci-devant provinces of Forez and Auvergne, from which they extend in a S.W. direction. They formerly gave name to the district of Languedoc, over which they spread; and in the acceptation of some writers this name has comprehended the districts of Gevaudan, Vivarais, and Vellai or Velai, though only a part of these districts is occupied by the Cévennes. These mountains are at present comprehended in the departments of Gard, Lozère, Haute (or Upper) Loire, and Ardèche. They may indeed be considered as extending into the departments of Hérault and Aveyron; for it is difficult to ascertain to what part of the chain to which they belong (which extends nearly to the Pyrenees, being separated from these only by the valley through which the canal of Languedoc runs) the name of Cévennes should be restricted. In this article we shall consider them as extending from the sources of the Orb, which waters Beziers, to Mount Mezene or Mezin, in the neighbourhood of the sources of the Loire.

The general direction of the chain is N.E. and S.W. From Mount Lozère, which may be assumed as the centre of the chain, several branches are thrown off, as the mountains of Margeride towards Auvergne, serving to connect the Cévennes with the volcanic groups of that province; the [illegible]ins of Aubrac, into the country watered by the [illegible]re and the Lot; and those of Levezou [illegible] Levezou, into that watered by the Aveyron, [illegible]. The Cévennes separate the streams which flow into the Mediterranean from those that flow into the Ocean: the former (the Ardèche, the Baume, the [illegible], the Céze, the Gardon of Alais, the Gardon of Anduze, all of which flow immediately or otherwise into the Rhône; the Hérault, with its tributary the Ergue; and the Orb) rise on the S.E. slope of the chain: the latter (the Loire, the Lot, the Tarn, the Sorgues, &c., all of which, with the exception of the Loire, ultimately swell the current of the Garonne) rise to the N.W. slope. The highest points of the chain are La Lozère, 4888 feet; Gerbier de Jones, in which the Loire rises, 5125 feet; and Mount Mezene, 5820.

In the absence of a trustworthy guide, we feel some difficulty in giving even an approximate statement of the dimensions of the chain. The following measurements are from the map of France, published at Paris, in 1818, by A. H. Brué, and the map published by the Society for the Diffusion of Useful Knowledge: From Mount Mezene to Mount Lozère is 36 or 38 miles; from Mount Lozère [illegible] sources of the Orb, 56 or 58 miles.* The breadth of the chain is more difficult to give, owing to its connexion on the N.W. side with the mountains of Auvergne: from Bedarrieux to St. Rome on the Tarn is 34 miles; from Ganges on the Hérault to the Tarn between Ste. Enimie and Compeyre is 32 miles; from Aubenas to Pradelles, 28 miles. The country covered by the Cévennes may be roughly estimated at from 2500 to 3000 square miles. The S.E. side towards the basins of the Rhône and the Hérault has the most rapid descent.

The mountains L'Esperon, L'Aigoual, and others, near the source of the Hérault, consist of a variety of rocks, among which granite seems to predominate: the granite is of several varieties. Considerable detached blo[illegible] this rock found lying on the surface are conjecture[illegible]heir rounded form, to be the remains of blocks, [illegible]ners and projections of which have been smoothed down by the action of the waters and the air. The mountain-streams of this district scarcely ever dry up in summer, and in their beds (especially of those whose waters have the greatest fall) are found masses of granite, rounded and polished by the action of the waters. These masses, some of which are from ten to thirty feet in diameter, appear to have been detached and brought down from a distance by the inundations caused by these streams; for the nature of the soil in the immediate neighbourhood of the spots where they are found precludes the supposition that they had their origin in the bed of the streams and have been denuded by the action of the waters. These rocks are surrounded with the debris caused by the destruction to which they have been subject. Some of the granite is so soft that its granular texture may be destroyed by the hand, or at any rate by the stroke of a hammer. The rocks of this part of the Cévennes, besides granite, consist of talcite and schistus: no marine shells are found in them.

The Cévennes contain several other species of granite. One species, not so common as that mentioned above, is of a dingy grey colour, inclining to yellow; it is found, not in blocks, but rather in veins of no great size; it is hard and close grained, cleaving sometimes across the direction of the vein, like slate, but into slabs of considerable thickness. This granite is used for building dry walls, as, from its cleavage being square, its surfaces admit of being exactly joined. There is another species, of a pinkish red colour, the hard varieties of which are similar in colour and hardness to Egyptian granite; but this is found only in one part of the mountains.

In other parts of the mountains the rocks are calcareous. The streams which flow from Mount L'Esperon, whether those which flow into the Tarn and by that into the Garonne, or those which flow into the Hérault, when they have their bed or their banks formed by calcareous rocks, are often absorbed, and re-appear after an interval varying from a quarter or half a mile to a mile and a half; and this notwithstanding their sources supply a sufficient quantity of water for them to flow on, under ordinary circumstances, without interruption. The place where a river is thus absorbed is called in the language of the country an *aven*. No similar phenomena are observed in [illegible] which have their bed in the granite district.

Wherever the granite predominates, the vegetable soil is very light and universally suited to the growth of certain c[illegible] granite and sandy districts that the [illegible] greatest size and height. Those which [illegible] vegetable soil is calcareous are [illegible] lower growt[illegible] the granite, being easily ca[illegible] off by the he[illegible] rains, form the sands, which being ca[illegible] down to the Mediterranean by the Hérault and the Rhône, (many of whose tributaries rise in the Cévennes) serve to line with sand-banks the coast of that sea. It is in the granite districts that gold dust is found. Those who gain a livelihood by seeking it gather their most abundant harvest after the great inundations, when the waters have spread far over the neighbouring soil. It is only in granitic and talcose deposits that gold dust is found.

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* See fig. vol. iii. plate

Talcite and schistus are found in the same district with granite, or with calcareous rocks; but the granite and the calcareous rocks appear to occupy different districts. Towards the base of the chain, considerable beds of roofing slates are found.

The Cévennes are naturally of difficult access; but the ro[illegible] which were made by government about the close of the seventeenth or the commencement of the eighteenth century have done much to remedy this inconvenience. The country over which they spread contains, notwithstanding its rugged character, a considerable population. It furnishes an ample supply of game and fruit: chestnuts are particularly abundant, and constitute an important article of food to the inhabitants. The valleys, which are tolerably fertile, especially along the banks of the Rhône, furnish pasturage to a considerable quantity of cattle.

The cultivation of the sides of the Cévennes is carried on with great diligence, and places which would seem to be the least suited for it have been rendered available by the careful industry of the inhabitants. They raise across the ravi[illegible]med by the mountain torrents a wall of loose ston[illegible]gh which the waters, when clear, pass readily; but [illegible]er a storm or sudden shower, they bring down earth [illegible] stones, these walls act as a filter: the earth and stones are deposited, and in time form a platform of good ground. Successive platforms are raised one above another like a flight of steps. On these platforms vines and mulberry trees are planted, and potatoes, maize, and other species of grain are produced. In other places the natural terraces formed by the strata of the rocks which constitute the mass of the mountains are bounded by the walls of loose stones formed by the peasants, and the troughs thus formed are filled with vegetable soil obtained from the cliffs and cavities of the mountain, or conveyed by the peasants from the foot of it upon their backs. The disasters caused by the rains, which overthrow the walls and wash away or remove the soil, are repaired by the care of the hardy mountaineers, who, wrapped in an oil-skin d[illegible], with a broad hat of tinned iron, bid defiance to the elements, and convert, by irrigation, to a useful purpose, the waters which would else destroy the fruit of all their labours; or they perseveringly repair the damage which they cannot prevent.

These mountains are mentioned by antient authors, both Greek and Latin. Cæsar (*de Bel. Gal.*, b. vii., c. 8) speaks of them under the name of Cevenna;* he crossed them in his contest with the Arverni and their confederates under Vercingitorix. The presumed difficulty of the passage had encouraged the Arverni, who deemed themselves covered from attack by these mountains as by a wall. The passage was made early in the year, and Cæsar had to make a road through snow six feet deep. Strabo gives to this range the name of Κέμμενον ὄρος, while Ptolemy uses the plural form, τὰ Κέμμενα ὄρη. The fastnesses of these mountains afforded refuge to the Huguenots in the religious wars of France. The inhabitants have retained till of late years the reputation of being a restless race, ever ready to revolt, and they have been ever suspected of being Huguenots in their hearts.

In 1703 the Huguenots of these mountains rose in arms and committed the most fearful excesses. They had been driven into rebellion by the persecutions to which they had been subjected on account of their faith and by fiscal oppression. The excitement was increased by the prophecies which were uttered by those who, either from mad enthusiasm or artifice, assumed the prophetic character. 'No taxes,' and '[illegible] of conscience,' were the devices inscribed on their [illegible] With a fury naturally inspired by the cruelty and injustice which had goaded them into rebellion, they broke out into the most dreadful excesses. They sacked the churches and massacred the Catholic priests and laity, men, women, and children. The revolt was of sufficient importance to justify the employment for its suppression of the Maréchal de Villars, the most able, perhaps, of the French generals. 'Sire,' said Villars, in accepting the appointment, 'I will attempt, if your Majesty will allow [illegible] to soften by mildness evils that rigour, in my opinion, only aggravate.' 'I leave it to you,' replied the king; 'you know well that I prefer the preservation of my people to their ruin, which I look upon as certain, if this unhappy war continues.' Villars immediately [illegible]d to [illegible] of war: those who laid down their arms were leniently treated, those who continued to resist were destroyed. The submission of Cavalier, the leader of the Camisards, as these Protestants were called, a youth of extraordinary natural talents, though a heavy loss to the rebels, did not bring the contest to a close. Villars was recalled, to be employed in matters considered to be of greater importance; and it was not till 1705 that the revolt was put down by the duke of Berwick.

CEYLON lies between 5° 54′ and 9° 50′ N. lat., and 79° 50′ and 82° 10′ E. long. It is separated on the N.W. from the Continent of India by the Gulf of Manaar. Its extreme length is about 270 miles from N. to S., and its extreme breadth 145 miles: the circuit is about 750 miles. Its area is about 24,664 square miles, or about 2000 square miles less than that of Ireland; but no accurate survey has been made. The population, according to the census of 1833, is 1,126,808.

In Sanscrit writings Ceylon is called Lunka, holy or resplendent; in the Singhalese annals it is called Sinhala-dwipa, the island of lions. The Arabs named it Surendib, which is only a corruption of the genuine name; and the Portuguese, Selan. It has been called Hebenaro, the fertile island; Eelam, the insular kingdom; and Tenesserim, the place of delight. To the Greeks and Romans it was known under the name of Taprobane, and Salice (Ptolemy). Being favourably situated at the W. entrance of the Bay of Bengal, and bounded on the S. and E. by the Indian Ocean, it is admirably adapted for an entrepôt of eastern commerce: and though at present impoverished and thinly peopled, yet, through the impulse given to commerce and industry by the late abolition of pernicious monopolies and the emancipation of its people from compulsory labour, it promises to become one of the most important of the English possessions.

The eastern shore of the island is in many ports bold and rocky, and the water deep. The N.W. and W. shore from Point Pedro to Colombo is uniformly low, and indented with bays and inlets: the south and south-eastern shore is elevated, and presents a highly picturesque appearance.

The N.W. coast of Ceylon is almost joined to India by the island of Manaar, Adam's Bridge, and the island of Ramisseram. There are only two passages through the strait. One of these, called the Manaar Passage, which separates the island of Manaar from the opposite coast of Ceylon, near Mantotte, is not above four feet deep at high water. The other, called the Paumban Passage, separates the island of Ramisseram, celebrated through India for its pagoda, from the opposite coast of India, near Tonitorre Point. This passage is very narrow, and not above six feet deep at high water.

An opinion which prevailed, that these passages were once much deeper, and might now be deepened without much difficulty, led to a particular survey of the Paumban Passage being made. But the result seems to be, that the passage has never been deeper than at present. The project of deepening the passage was abandoned in consequence of the refusal of the continental government to co-operate in effecting it, the expense being beyond the means of the C[illegible]lonese government. But it is to be hoped, for the intere[illegible] commerce, and more especially for the maritime i[illegible] of Ceylon and India, that it will yet be accompli[illegible] dry. Paumban is a narrow passage through a ridge extending from the island of Ramisseram to the continent. The dam or ridge, which is 2260 yards [illegible] runs E. and W., and is bounded by two paralle[illegible] ry cold nights. rocks 140 yards apart. The northern ridge is the [illegible] is in most places visible at low water; of the sou[illegible] On the [illegible] only a few detached rocks appear. The space between the ridges is occupied with irregular masses of rock. [illegible] having the is a soft sandstone, about three feet thick, resting on of gravel; and it extends continuously in opposite directions on the island and on the continent. The ridges have the appearance of having been burst through by the sea; and the island Brahmins state that they were continuous in 1484 A.D., when the Swamy of Ramisseram was conveyed over them thrice yearly on particular festivals. A breach being afterwards effected, it was repaired, but it was re-opened and enlarged by the violence of the waves, and it is universally believed by the neighbouring inhabitants to be continually enlarging. There are two passages in the dam: the eastern, used by vessels drawing not more than four or five feet water; and the western used by canoes and small boats only. The eastern passage is fifty yards broad, of irregular depth, and rocky bottom, winding and shallow; all which circumstances cause great delay and expense to vessels. In rough weather it is sometimes impassable, and frequently dangerous; and under favourable circumstances it takes three or four days to get through. In giving attention to the enlargement of the Paumban Passage, it is necessary to take into account a neighbouring sand-bank, on which there is only seven feet water, and which is probably a greater obstacle than the ridge of rocks: more especially as it is formed by deposits from the currents which run through the breaches in the ridge.

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* Cebenna and Gebenna are various readings of this name in Cæsar. We follow Oberlin in giving Cevenna. Pliny and Mela give Gebenna.

Adam's Bridge is the ridge of sand-banks connecting Manaar with Ramisseram [ADAM'S BRIDGE].

The physical structure of the interior of Ceylon is not yet well known. The great mass of the high land is in the southern and wider part of the island, and the central parts of this mountain region seem to be intersected by the seventh parallel of N. lat. Numerous offsets from this nucleus are detached towards the S., S.E., and S.W. coast, forming the boundaries between valleys that are drained by rivers rising in the central mass, and running S., S.E., and S.W. This part of the island contains Adam's Peak, which was supposed to be the highest mountain in the island. But the most elevated point is now ascertained to be Pedrolallagalla, which is 8280 feet above the sea, and is surrounded by a tract of elevated country of very irregular surface, and well adapted for almost all the productions of temperate countries. This table-land is generally from 2000 to 3000 feet above the sea. From the central mass in the territory of Candy, a range of high land runs due N., probably nearly as far as 9° N. lat., forming the western boundary of the basin of the Mahawelli Ganga (the chief river of the island), and separating the waters which flow into this river, or towards the east coast, from those which run westward into the Gulf of Manaar. This range is very little known. The interior mountainous district contains numerous beautiful valleys, and prodigious forests. The N., N.E., and N.W. parts of the island are generally flat.

Heights of some of the principal Mountains, &c., in Ceylon.

[L, by levelling; Δ, by geodesic operations.]

Pedrotallagalla, close to the rest-house of Nuwera Ellia	8280	Δ
Kirrigal Potta	7810	Δ
Totapella	7720	Δ
Adam's Peak	7420	Δ
Plain of Wilmanie	6990	Δ
Nammoonnakoollé, near Baddoola	6740	Δ
Plain of Nuwera Ellia	6210	Δ
The Knuckles	6180	Δ
Diatalawé, near Hangooranketti	5030	Δ
Hoonnassgiria Peak	4990	Δ
[illegible]agalle, the rocky ridge of Hantanné to the S. of town	4380	Δ
Amboolluawa, near Gampalla	3540	Δ
Hoogalle, near Amoonapoorre	3440	Δ
[illegible]lan Pattana, the hill above it	3192	Δ
[illegible]est point in the road leading through the [illegible]dooganawa Pass	1731	L
[illegible]e in Candy	1678	L

[illegible]—The island abounds with mountain streams. The rivers are more numerous on the S. and on the N.E. side. Those which flow through on the E. and N. formerly filled the numerous [illegible] rendered those districts the most fertile and [illegible]. These districts, now deserted [illegible] grown with [illegible] contain remains of numerous [illegible] for conducting and distributing the waters. The [illegible] rivers are the Mahawelli Ganga ([illegible] Ganges of [illegible]emy), the Kalani Ganga, the Kalu Ganga, and the Walawe Ganga, all of which rise in the central [illegible]. They are navigable only for boats and rafts. The Mahawelli Ganga, after descending from the [illegible] plains, and traversing the valley of Kotmale under the name of Kotmale Ganga, is joined near Passbage by a smaller branch from the base of Adam's Peak. It then passes through the village of Paradenya, four miles from Candy, where it is crossed by a modern bridge of one arch, 205 feet span, constructed of satin wood, on the American or wedge principle. Between Candy and Bintenne the river descends above 1000 feet, and receives in this part of its course numerous streams. At Bintenne, at the foot of the mountains, its average breadth is 340 feet, and its depth at the ford 5 feet; in the dry season 1 or 2 feet, and during freshes 25 or 30 feet. After a slow northern course through the country of Bintenne it separates into two branches: the smaller, the Vergel Ganga, enters the sea 25 miles S. from Trincomalee; the larger, retaining the original name, falls into the great bay of Trincomalee. It is ascertained that, by the removal of certain obstacles, which might be easily effected, the river might be made navigable as far at least as Kalinga, a distance of 80 miles. Its antient navigation was interrupted by the turning of the stream. The Brahmins of the temple, at the mouth of the Vergel, in order to improve their lands, widened and deepened the Vergel at this point, by which the Mahawelli Ganga was made dry for ten miles from the point of separation for nearly the whole year. During the freshes there is however dangerous navigation for rafts round the elbow at the junction, where much timber is lost annually by the directors abandoning it, and swimming for their lives. As almost the only export from Trincomalee is timber, consisting chiefly of halmaille, ebony, and satin wood, procured from the banks of this river and the vicinity, the importance of [illegible] its navigation is obvious. This river flows through a country once the granary of the island, as indicated by the numerous remains of works of art for the irrigation of the land, which, now fallen into decay, serve only to form pestilential morasses. Its whole course is near 200 miles. The Kalani Ganga runs a west course for 35 miles to Ruanwelle, and thence to Colombo. It is navigable, with little interruption in the dry season, for boats of considerable burden, higher than Talgamme. The Kalu Ganga takes a west direction, and after passing through the districts of Saffragam and Three Korles enters the sea at Caltura. It is navigable a little above Ratnapoora. The Walawe Ganga has a S.E. course to the sea, eight miles to the N. of Hambantotte.

Harbours.—At Trincomalee and Point de Galle there are harbours capable of containing the largest ships; and the roads of Colombo afford a secure anchorage at certain seasons: indeed, in the harbour of Trincomalee all the ships in the world might anchor, and be protected at any season. On the S.E. coast there are four ports in which small vessels may find shelter, and five on the N.W. coast.

Lakes.—There are a few lagunes in the island: those best known are in the vicinity of Negombo and Colombo. In the maritime provinces, at a very remote date, canals with stupendous embankments were constructed by the Singhalese to connect extensive salt-water lakes. Artificial lakes also were formed, many miles in circumference, for the purposes of irrigation.

Water Communication.—At present the only canal of any importance is that which connects Calpentyn with Colombo. It was projected by the Dutch, but long remained in an unfinished state, until Sir Edward Barnes, coming to the government, completed it about 1829.

The flatness of the districts bordering on the sea-coast has occasioned the formation of extensive salt-water lakes, or lagunes, which, by means of the channels connecting them, facilitate the intercourse of the maritime districts. Batticaloa, on the east side of the island, is much intersected by these lakes, which afford valuable means of internal communication. These lakes extend along the eastern coast to the northward of Trincomalee, nearly separating the northern and southern parts of Jaffna. This district, and that of Manaar, lying [illegible] to the coast of Coromandel, possess greater facilities [illegible] with the continent than the districts to the southward, the native vessels being able to cross over at all seasons—a circumstance which favoured the Malabars in their invasion of

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the country, and which now facilitates the commerce carried on with the continent.

The intercourse between Colombo and Galle and the continent is impeded during the S.W. monsoon by the boisterous navigation of the gulf of Manaar, and the dangers of the coast. This circumstance led to the formation of the canal which connects the lakes and rivers between Calpentyn and Colombo. Calpentyn is accessible to vessels during the S.W. monsoon; and their cargoes are conveyed thence in boats. This arrangement is of great commercial importance to the neighbourhood, and, with the advantages of climate and proximity to India, offers great inducements to settlers of all descriptions.

Roads.—The country being intersected by deep ravines, often impassable, and covered with thick jungle, the communications are rendered extremely difficult. Under the Candian government the opening of roads was prohibited, and the passes were strictly guarded. Narrow paths were made, by which men on foot could pass singly, climbing over the rocks, and through the thickets. In thus providing for the defence of the country, its improvement was necessarily retarded; and from the little intercourse which subsisted with the maritime provinces, the habits and institutions of the people were of the most simple and primitive kind, exhibiting curious remains of their social condition in very remote ages. But since the occupation of the country by the British, and more particularly from the time of the administration of Sir Edward Barnes, who made great exertions to open the communications, which have been efficiently followed up by the present governor, Sir R. W. Horton, carriage roads have been constructed at a vast expense. That civilization receives a powerful impulse by the opening of communications, and that it advances in proportion to the facilities of commercial intercourse, are facts which have been re[illegible] illustrated in Ceylon. Roads being opened they wer[illegible]vered with the vehicles of commerce. The fruits of the people's labours purchased those comforts and luxuries which had before been denied to their poverty; and in every respect they profit by intercourse with their more enlightened countrymen, and with Europeans. Bazaars and villages have sprung up along the roads; and the productions of Europe are sold in every village. Under the present governor a mail-coach has been established between Colombo and Candy, which already pays 8 per cent. to the proprietors.

The principal roads in the maritime provinces run along the sea-coast; and carriage-roads have been made from Colombo as far as Chilaw to the northward, and through Galle as far as Matura to the southward. Carriage-roads have also been made from Colombo to Candy; one by the way of Kurunegalle, which is in the direction towards Trincomalee, through the flat country; the other by a nearer route over a pass in the hills. Several other roads and communications through the districts have been opened, and some are now in progress. The main road to Candy, a work of great magnitude, has been carried through some difficult passes in the hills, and connected by several bridges, the largest of which, over the Mahav[illegible] has been already described.

Climate.—The climate of Ceylon is principally influenced by the two monsoons. The north-east monsoon prevails from November to February, and the south-west monsoon from April to September. In the intervening months variable winds and calms prev[illegible] The seasons are however subject to fluctuation, the [illegible]th-west wind being generally more prevalent. Sometimes indeed at Colombo this wind blows for five months together, and the north-west wind blows during the months of December and January only. Local circumstances modify the winds of the interior according to the distance from the east and west coast; thus, at Badulla, in Upper Ouvah, during the months of June, July, and August, the wind is variable, and for the remaining nine months it blows from the north-east. The heat is not so great as on the neighbouring coast of India, the sea-breezes moderating the temperature, and making the air more agreeable and salubrious. At Colombo the mean daily variation of the temperature does not exceed 3°, and the annual range of the thermometer is from 76° to 86½° Fahrenheit. At Galle the mean daily variation is 4°, and the annual range from 70° to 87°. At Jaffnapatam the mean daily variation is 5°, and the annual range from 70° to 90°. At Trincomalee the greatest daily variation is 17°, and the annual range from 74½° to 91½°. At Candy, 1457 feet above the sea, the mean daily variation is 6°, and the annual range from 66° to 86°; and at Newera Ellia, 6210 feet above the sea, the mean daily variation is 11°, and the annual range 35½° to 80½°; in 1831 however the highest temperature was only 73°, and this was attained but once.

In Colombo, in 1830, 102 inches of rain fell. Of these 102 inches, there fell in April, May, October, and November, in the following proportions: in April, 11 inches; in May, 21 inches; in October, 21 inches; and in November, 20 inches.

The eastern part of the island, which is open to the N.E. monsoon, partakes of the hot and dry climate of the coast of Coromandel. The western division, which is open to the S.W. monsoon, has a climate like that of the Malabar coast, which is temperate and humid. The N.E. winds, although accompanied with rain, are drier than those from the S.W., and the country over which they blow has an arid appearance, as contrasted with the luxuriant verdure of the southern and western districts, which continues during the greater part of the year. The driest seasons are those which are situated between the range of the two monsoons, partaking slightly of the influence of both.

The climate and seasons of the northern and southern districts may be thus strikingly contrasted. On one side of the island, and even on one side of a mountain, the rain may fall in torrents, while on the other the earth is parched and the herbage withered. The inhabitants in one place may be securing themselves from inundations, while in another they are carefully distributing the little water of former seasons, which is retained in their wells and tanks.

CEYLON METEOROLOGY.

	Colombo (sea shore) Register.									Badulla (2107 feet above the sea) †.					
	Thermometer.					Barometer.		Wind.	Rain Gauge Inches *.	Thermometer.					Remarks by a Candian Chief, the result of Sixty Years' Observation.
	Mean Morning.	Mean Mid-day.	Mean Night.	Highest.	Lowest.	Maximum.	Minimum.			8 A.M.	Noon.	8 P.M.	Highest.	Lowest.	
January	76	81	79	82¼	76	29.85	29.60	N.	1.0	62	73	66	74	55	Heavy rains and very cold nights.
February	79	83	81¼	85	76	30.	29.95	N. to N.E. and S.W.	0.4	63	74	63	77	55	No rain; hot.
March	80	84	82	85	77	29.90	29.80		8.1	62	76	67	80	60	A little rain, and warm.
April	81	84	82	85¼	80	29.87	29.85		11.7	66	78	70	80	62	No rain; very warm.
May	[illegible]	[illegible]	[illegible]	86	79	29.93	29.80	S.W.	6.6	68	78	71	83	64	Light rain; windy.
June	81	83	82	86	79	29.88	29.	S.W.	2.3	64	77	72	80	65	No rain; hot and dry.
July	80	83	81	84	79	29.98	29.	S.W.	10.7	63	74	71	81	60	No rain; very hot.
August	81	83	[illegible]	86	80	29.90	[illegible]	S.W.	3.5	66	79	71	83	60	No rain; hot.
September	[illegible]	[illegible]	82	85	81	29.90	29.80	S.W.	8.3	66	78	72	82	63	No rain; hot.
October	80	82	81	83	78	29.90	29.80	S.W.	7.1	66	79	72	83	62	Heavy rains; cool.
November	[illegible]	[illegible]	81	83	79	30.	29.90	S.W. to N. and N.E.	7.1	67	75	71	83	62	Heavy rains; cool.
December	[illegible]	[illegible]	82	84	78	29.80	29.60		18.6	67½	73	71	75	62	Hot and dry; very cold nights.

* [illegible] gauge, showing a total of 85.3 inches, is for Candy (in 1819), in the interior, which shows the average of [illegible]. On the [illegible], as at Colombo, the average annual fall of rain is from 75 to 80 inches.

† Badulla is situated on a plain surrounded by hills, from 1000 to 3000 feet high, in a mountainous country, in the south[illegible] extremity of Ceylon, [illegible] the elevation above the ocean level is 2107.

Very erroneous opinions have been entertained with respect to the insalubrity of Ceylon, founded on the returns of mortality among the troops while they were engaged in arduous service, and suffering from exposure, fatigue and pestilential miasmatic influence; which, with our present better knowledge of the climate and localities, and the existence of the excellent roads which have since been constructed, would have been avoided. This is to be regretted, as it must doubtless have interfered most prejudicially to all parties in the business of life assurances.

The following is an abstract of the returns of mortality of the European troops at Ceylon, for several years previous to 1833:—

97th Regiment, in a period of	7 years	. $27\frac{11}{33}$	per cent.
78th "	" 6 "	. $24\frac{18}{23}$	"
61st "	" 4 "	. $16\frac{204}{287}$	"
58th "	" 4 "	. 11	"
Royal Artillery	" 4 "	. $20\frac{49}{73}$	"

The following is an abstract of the returns of mortality of the European troops in Ceylon for 1833 and 1834:—

	No.	Deaths.	Per Cent.
1833	1985	57	$2\frac{1730}{1985}$
1834	2060	70	$3\frac{41}{103}$

From January to August, inclusive (eight months), as appears by an authentic return, the average number of sick in a regiment at Colombo was less than that of reserve companies of the same regiment stationed in Ireland, in the proportion of 10 to 16.

Europeans and the descendants of Europeans at Colombo sometimes attain the age of 100, without scarcely ever having suffered pain or sickness; and it is probable that were the island cleared and generally brought under cultivation, it would be as healthy as England. The climate of the maritime districts, especially those which are populous and therefore more generally cultivated, is more free from miasmata than those of the interior. By draining and clearing from jungle the neighbourhood of Trincomalee, its climate has been improved; while Seven Korles, a most productive province, has recently become unhealthy by the falling to ruin of tanks, and the consequent growth of jungle. Rank shrubs of luxuriant growth, found in marshy and uncultivated tracts, are most productive of miasmata. The low lands in the neighbourhood of Colombo, subject to frequent inundation, being regularly cultivated, do not affect the purity of the air; while an uncultivated marsh to the north of the town renders the winds which blow over it insalubrious.

Geology.—A few species of primitive rock in numerous varieties constitute the principal formations of the island. Granite and gneiss are the more prevalent; quartz, dolomite, hornblende, primitive green-stone, and a few others occur less frequently. The varieties of granite and gneiss, which often pass into each other, are very numerous. Regular granite is not common; but it is met with at Point-de-Galle. Gneiss is far more abundant than granite; a beautiful kind is found at Amanapoora (7° 15′ N., 80° 30′ E.), which contains a very large proportion of felspar. At Trincomalee quartz occurs in veins and in masses, embedded in granite. Hornblende and primitive greenstone are found on Adam's Peak. Dolomite is found only in the interior, and is used for making lime. It is in this rock that the nitre caves are found. The only recent rocks occur in the level belt near the sea. Fine-grained compact limestone is found in great abundance on the northern extremity of the island. Along the remainder of the coast sandstone generally prevails, lying in horizontal beds along the beach, but seldom extending beyond it.

Minerals.—Ceylon contains numerous useful minerals, and many valuable gems. Iron is very generally diffused. The black oxide of manganese is found. Plumbago abounds, and is exported in considerable quantities. There are no [illegible] than twenty-two caves from which nitre, nitrate of lime, and a small proportion of alum are obtained. The sulphate of magnesia is found in only one cave, and according to Dr. Davy it is equal to the best Epsom salts. Salt is found in natural deposits, and is formed by artificial means in several parts of the maritime provinces, particularly in Mahagampattoo, and yields a revenue of 29,000*l.* per annum.*

Of the gems of Ceylon the ruby and cat's-eye only are held in high estimation; and among the late King of Kan[illegible] of jewels (sold by auction in London, in 1820), there was [illegible] the latter stones which measured two inches in dia[illegible] and sold for more than 400*l.*

[illegible]s.—There are several hot springs in the island: five at [illegible]iya, in the neighbourhood of Trincomalee, and two in the province of Uwa. The former are resorted to by invalids suffering from rheumatic and cutaneous disorders; at 7 A.M. the temperature of the air being 72° of Fahrenheit, their heat varied from 86° to 107°. The water [illegible] pure with the exception of the slightest trace of common salt and a little carbonic acid gas and azote. The Uwa springs are more than 1000 feet above the sea, and have a temperature of 76° and 85° respectively. At Alootnoowera there are two springs, the temperature of which is sufficiently high to dress food. In lat. 7° 15′ N., lon. 81° 20′ E., near the Patapala river, there is a hot spring which constantly emits air bubbles.

Soil, Agriculture, &c.—Quartzose gravel or sand, and felspathic clay, mixed with oxide of iron, derived entirely from the decomposition of the prevailing rocks, generally compose the soil of Ceylon. The natural soils seldom contain more than three per cent. of vegetable matter, while quartz often constitutes nine-tenths of the whole. In the cinnamon gardens at Colombo the soil is composed of pure quartzose sand as white as snow. A brown loam formed by the decomposition of gneiss and granite, and a reddish loam resulting from the decomposition of clay iron-stone called *cabook*, are the most productive soils, and the quartzose the least so.

The line of coast from Negombo to Tangalle is particularly favourable to the growth of the cocoa-nut tree, which increases in value the nearer it approaches the southernmost parts of the island. Cinnamon is also chiefly confined to this district and the hills of the interior. The soils in the elevated lands of Saffragam and Lower Ouvah, and the granitic soils in the mountains above, are fertile. Coffee grows luxuriantly in the hilly country, and in C[illegible] fine tobacco is produced. The provinces of Ouvah [illegible] and Bintenne, to the eastward, and the adjoin[illegible] of Saffragam and Tangalle, and the extensive pla[illegible] the north of the hills, are generally fertile, and were once populous and productive. They are now, except Tangalle, depopulated, though the remains of works for artificial irrigation are found there. The number and extent of works for artificial irrigation in the province of Nuwerakalawa prove that it was once the most populous part of the island.

The soil of the northern division is sandy and calcareous, and is artificially irrigated and well tilled by the Malabars. Near Jaffna is a natural reservoir, which the government attempted to appropriate for agricultural purposes. A steam-engine was applied to raise the water, but at a certain depth it was found to be brackish, and still deeper it was quite salt. In Jaffna rice and tobacco are most cultivated, but cotton and other plants thrive there. It is a good sheep country, and the Palmyra palm abounds. On the coast from Chilaw to Manaar and Jaffna on the western side, and from Tangalle to Mahagampatoo to the eastward, are the most valuable salt-farms.

The antient inhabitants appear to have been ren[illegible] skilful in the execution of works for the collection and [illegible]tribution of water, the most remarkable of which are the spacious tanks excavated in the plains, and the dams constructed across the beds of rivers, or over ravines and valleys, connecting small hills, and forming extensive lakes for flooding the plains in the driest season. Such works are met with in the district of Tangalle, and in the deserted provinces to the northward and eastward, now the resort of the wild tribe of Veddas, who live chiefly by deer hunting. The lakes of Kandelay and Minery, each of which covers an area of several square miles, are situated in the plains extending from Trincomalee to Anooradhapoora, the antient capital of the island, and from thence across to Manaar and Arrippo, in which district a reservoir of great extent, called the Giant's Tank, was formed, and a stone dike was constructed across the Arrippo river to divert the current into it. These works are very antient, that of [illegible] authentic records, to have been constructed three centuries before the Christian era. They were executed for the improvement of lands, which were probably distributed among the people employed in the work, who dedicated a portion of their revenues to the temples and priesthood.

The lands on the northern division are manured and cultivated with care by the Malabars, who irrigate them extensively from tanks and wells. The arable lands and divided into rice-fields, [illegible]nds enclosed by embankments to retain water. In the low countries, where they can be irrigated by rivers or tanks, extensive tracts are thus laid out. In the hills the rice-fields are cut in terraces, which are watered by the mountain springs, and separated by tracts of high ground attached to them, which are cultivated once in eight or ten years by cutting down and burning the jungle.

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* See [illegible] vol. iii. pl

Lands were formerly assigned for the performance of certain services, or on condition of making certain contributions. The public land is now sold by auction at an upset price of *5s.* per acre, a price not sufficient even to pay the expenses of surveying it, which is done by the government, and there is no tax imposed on the produce of lands so sold. Since the important change made in the tenure of lands, by relinquishing claims of service and substituting other relations in property, a remarkable impulse has been given to agriculture; waste lands are being brought into tillage, and more particularly in the high lands the jungle is being burned, cleared, and supplanted by the dry grains.

Vegetable Productions.—Among the trees indigenous to the island, cinnamon, of which Ceylon may be said to have the monopoly, is the principal; but the cocoa-nut tree is the most important to the island. This tree contributes largely to the subsistence of the people, and when the grain crops fail or are destroyed by inundation, averts much of the misery of so serious a calamity. The leaves of this tree, each twelve or thirteen feet long and three feet broad, together with the flowers, are used by the natives to ornament their dwellings on festive occasions. They are also an excellent food for elephants, and are plaited into *cadjans* and *cusingoes* for thatching houses. The leaves are also wrought into brooms, and *chools* or [illegible] for travellers. The sap, called *toddy*, is extracted and used as a beverage in its natural state, and converted by distillation into arack. *Vinegar* is also made from this sap, and, by boiling, a coarse sugar called *jaggery* is formed from it. The kernel of the nut is used in culinary purposes; but the principal part is converted into *copperah* by being dried in the sun, and in this state is transferred to the oil-press. The *oil* is used for culinary purposes, for anointing the hair and body, for burning in lamps, and for making candles and soap. The refuse oilcake, called *poonat*, furnishes good food for poultry and pigs. The *shells* of the nut are formed into goblets, ladles, and other domestic utensils; and from the capsule cordage of all kinds, from the smallest yarn to a ship's cable, is manufactured. A great variety of other articles are manufactured from this tree; and the duties levied on the various products amount to 35,573*l.* per annum. In 1813 it was estimated that between Dondra Head and Calpentyn there grew ten millions of cocoa-nut trees, which produced, in addition to a great quantity of cocoa-nut oil, and six thousand leaguers of arack, upwards of three millions of pounds weight of coir. A good tree produced from 50 to 80, sometimes 100 cocoa-[illegible] in a year. Each cocoa-nut is considered equivalent, as [illegible] to at least 3 oz. of rice.

The Palmyra palm is hardly inferior in importance to the cocoa-nut. It abounds in Jaffna, and being productive in seasons of drought, when the crops fail, is of great value to the people. The leaves are used in the construction of native huts, and also as a substitute for paper, and various other purposes. Toddy is extracted from it, as from the cocoa-nut tree. The timber is used for rafters, and is exported in large quantities. Punattoo is a jelly made from the fruit, on which the poorer classes subsist in seasons of dearth.

The *Kittul* tree is peculiar to the South: its sap produces a coarse sugar, and its fruit, dried and pulverized, serves as a substitute for rice flour.

The leaves of the talipot tree are so large that one will shelter many individuals. They are used by the natives to protect them from the sun and rain. When softened by boiling they serve to write upon; and are of great durability.

The Ceylon Areca nut is celebrated for its superior quality, and is exported in great quantities.

For cinnamon, see CINNAMON.

A great variety of timber abounds in the island, and the restrictions by which government formerly prevented its being cut without a licence have been removed. Calamander, satin, rose, sapan, iron, jack, halmalille, and other beautiful woods for cabinet-work are in profusion.

The coffee plant thrives, particularly in the interior, and has of late been greatly improved by culture. It has risen much in public estimation, as is shown by the market price, which is only exceeded by that of Mocha. The remunerating price of coffee in the island is 40*s.* per cwt., and the price in the London markets is from 56*s.* to 62*s.* per cwt. The importation of coffee into the United Kingdom in 1832, the duty being 9*d.* per lb., was 2,824,998 lbs. The duty is reduced from 1st January, 1836, to 6*d.* per lb.; and the superior fertility of the soil, and the cheapness and abundance of labour considered, there is no doubt that the importations will be greatly increased.

Chaya root, which yields a scarlet dye, was once monopolized by the Government; but the monopoly has been relinquished. A particular class of natives only dig for these roots.

Tobacco is raised principally in the northern and southern districts. It has lately been exported only to Southern India, but the export duty having been reduced from 18*s.* to 2*s.* per cwt., it may be confidently expected that it will hereafter form an article of export to Europe, where it is approved, and to the Malayan markets as formerly.

Indigo grows wild, but is not now turned to account, though it was in antient times exported from Trincomalee and celebrated all over India, Arabia, and Persia, and greatly enriched the Ceylon merchants.

The pepper vine grows almost in a wild state; the cardamom plant is abundant; fruits and culinary vegetables are produced in great variety and profusion.

Rice was once exported, in large quantities, from Trincomalee to all parts of India; but at present hardly enough is produced in the neighbouring provinces for the consumption of the small population. Maha Prakrama Bahoo, who reigned in the 12th century, is said to have turned his particular attention to agriculture, and to have constructed 1475 new tanks, repaired 1885 others; excavated 534 new canals, and repaired 3300 old ones. Judging from the remains of such works scattered over the island, the account is probably not exaggerated. These works might be restored and the lands again brought into cultivation. At present rice is imported into the island from the opposite coast. The value of rice imported in 1831, was 55,344*l.* A tax on the gross produce of the paddy, which varies from $\frac{1}{2}$ to $\frac{1}{14}$, but which may be generally rated, in the maritime districts, at $\frac{1}{10}$, is exacted by the government. The revenue from this source was, in 1828—20,623*l.*; in 1829—32,961*l.*; in 1830—35,057*l.*; and in 1831—35,548*l.*

In 1833, there were 456,206 acres in crop; and 1,674,136 acres uncultivated. The produce raised was—Paddy, 3,976,540; fine grains, 804,937; coffee, 88,378; pepper, 6273; mustard, 923; a kind of pulse given to horses, 26,947; maize, 34,477; peas, 24,278 bushels:—cotton, 1,336,547; tobacco, 3,624,684 lbs. The live stock on the island—horses, 1128; horned cattle, 59[illegible]; sheep, 40,172; goats, 46,756.

Salt, arack, oil, and coir cordage are the principal manufactures. Iron, in small quantities, is smelted in the interior; and in the northern districts, cloths of moderately fine texture are made. A steam-engine is employed for expressing the oil at Colombo; and the more general introduction of this power is contemplated.

Animals.—The quadrupeds of Ceylon are for the most part like those of the opposite continent. Elephants are most numerous in the northern and eastern provinces; one European officer, in two years, killed four hundred. They often make predatory incursions in troops, and do great injury to the crops. Under the Candian government, the elephant was employed as a public executioner. After thrusting its tusks through the criminal's body, it tore him to pieces with its trunk, limb by limb. Elephants are generally found in herds. An elephant is sometimes excluded from the society of its fellows. Such elephant is always vicious and mischievous, attacking whatever approaches him, and passing herds will not permit him to join them. He is generally known and spoken of as the rogue elephant.

When the government commanded the services of the people, they were sometimes called forth in thousands to take the elephants in crawls, or enclosures formed of strong stakes and trunks of trees. In the district of Putlam they were faced boldly in the open jungle, and ensnared singly, for a reward varying according to the size and description of animal, from 11 to 352 rix

There are several species of deer, of which the [illegible] and [illegible] fallow deer are found in the greatest number; [illegible] also another of very diminutive size, called the [illegible] deer, *Cervus Aris*, which is caught by the natives, [illegible] exposed for sale in the markets. Wild hogs abound in the plains to the eastward; and a small species of [illegible] not unfrequently met with.

Of 20 different species of snakes examined by Dr. Davy, 16 were found harmless. The *Tic polonga* is the most venomous, and is believed to lie in wait to attack passengers. Pea-fowl abound wild. *Biche de mer*, used for food and paste in China, is collected off Chilaw and Jaffna.

The chank (*voluta gravis*), abounds on the N.W. coast of Ceylon. There are two kinds, *payel* and *patty*, one red, and the other white. A third species, opening to the right, is very rare, and highly valued by Hindoos. The demand for chanks, caused by the rites of the Hindoo religion, was once so great that the right of fishing for them was sold by the government for 60,000 rix-dollars per annum; but the demand decreased until the revenue from this source became not worth collecting; and now this fishery is free to all. The chank fishery was important as a nursery for divers.

Pearl Fisheries.—The most productive pearl banks are situated off Condachy, extending 30 miles from N. to S., and 20 miles from E. to W. The fishery generally commences in March, when the calm weather permits the boats to go out and return daily. The average net revenue from pearls, for 32 years ending in 1832, was 14,662*l.* per annum. The net revenue realized in nine previous years was, in 1834, 145,000*l.* That realized in 1835 was, 38,000*l.*

Killecarré is most probably the Colchi mentioned in the Periplus of the Erythræan sea as the site of these fisheries; and they are carried on in the same manner as described by travellers several centuries ago. The antient towns of Mantotte and Putlam probably derived much of their importance from their vicinity. The natural history of the pearl oyster is imperfectly known; but it dies soon after attaining its seventh year. In 1833, 1250 divers were employed, of whom 1100 were volunteers from the opposite coast. The share of profits gave each individual 5*s.* 9*d.* per day for the time he was employed: the price of ordinary labour being 6*d.* per day. But each bank being available only for one period, of about 20 days in every seven years, sometimes the fishery is smaller, and sometimes there is none at all; and in no season does it last for more than 30 or 35 days, commencing with the calm weather, about the 5th of March. The divers, in six or seven fathoms water, remain immersed from 50 to 55 seconds; very rarely longer. A reward being offered to him who should remain the longest under water, it was gained by one who remained 87 seconds. The diver's sack is not fastened round his neck, but is attached to a cord held by the man in the boat above; and it is pulled up when full, at the signal of the diver, who, if he choose, is drawn up with it. So far from the occupation being unhealthy, it is the belief of the natives that divers live longer than other labourers; and its short season is hailed as a gainful holiday by the divers themselves, who at other times are engaged in ordinary labour. If the oyster is taken before seven years old, its pearls are imperfectly developed; vigilance is therefore necessary to prevent indiscriminate fishing, which would destroy the banks, or at least render them quite unproductive. The pearls are sold by the government to the highest bidder. The sea fisheries are very productive on all parts of the coast.

History.—Onesicritus and Nearchus, commanders of the fleet dispatched by Alexander from the Indus to the Persian Gulf, brought the first accounts of the island to Europe.

Pliny states that Onesicritus had spoken of its elephants, and Megasthenes of its gold and pearls. Through a diplomatic mission which came to Rome from Ceylon in the time of Claudius, particulars were ascertained respecting its towns, population, and extensive trade, from which it appeared that the island was in a very prosperous and highly civilized state. Ptolemy speaks of rice, honey, and ginger, as the products of the island; and he mentions elephant feeding-grounds, the antient capital, and various places, which from the similarity of their present names may be easily identified. Cosmas Indicopleustes relates, on the authority of his friend [illegible] merchant, who visited Ceylon in the [illegible] differed from those of [illegible] of precious [illegible] and [illegible]ted of a proportion of Persians who had formed a Christian establishment. In the latter part of the 13th century the island was visited by Marco Polo, who describes it as the finest island in the world. About half a century later it was visited by Sir John Mandeville, who mentions Adam's Peak.

The Singhalese annals extant contain an uninterrupted historical record of events for 24 centuries, according to which their first king Hijaya founded his kingdom by the extirpation of the original inhabitants about 543 B.C., and their last king, Shri Wikrama Raja Singha, was deposed by the British in 1798 A.D. Evidence of the authenticity and accuracy of these writings has lately given a new value to them. Many of their descriptions of towns and buildings, and other works of art, have been tested by an inspection of the now-existing ruins, and the evidence thence drawn has been confirmed by deciphered antient inscriptions.

Of European nations the Portuguese first established a regular intercourse with Ceylon. The island being torn by internal wars, and invaded from Arabia and Malabar, the king purchased the assistance of the Portuguese with a stipulated annual tribute of 250,000 lbs. of cinnamon. The allies gradually gaining a footing in the island, at length, in 1520, strongly fortified themselves at Colombo, subjected the whole of the maritime districts, and retained possession of them for about 150 years. The Candians having called in the Dutch, the Portuguese were expelled, but the struggle lasted from 1632 to 1656. Batticalo fell in 1636; Point de Galle in 1640; Negombo in 1644; and Colombo in 1656. The Dutch, like their predecessors, established their dominion over the maritime provinces, and, in 1761, having taken Candy, they would have subjected the whole island had not the sickness of their troops obliged them to withdraw from the interior. In the war with the French, in 1782, the British took possession of Trincomalee, but it was shortly after retaken by the French, and the sea-coast remained in the hands of the Dutch until 1796, when it was wrested from them by the British and formally ceded to them at the treaty of Amiens.

In 1815 the tyranny of the native king, who had forced the wife of his prime minister to pound to death her own children in a mortar, and other acts which rendered his dominion intolerable, led to his being deposed; upon which the British took possession of his dominions at the invitation of the Candian chiefs, and have retained them ever since.

Government, Law, &c.—The native government of Ceylon was strictly monarchical. The king was proprietor of the soil, regulator of the feudal payments and services, and distributor of all public honours and emoluments. The classification of the people and the distribution of lands being the basis of the system of government, the civil and judicial administration of the country was entrusted to chiefs placed over different departments and in various provinces and districts, with a gradation of inferior functionaries. The services of all were rewarded with certain privileges or possessions. The head man of each village, to whom the people immediately referred, directed the labour of the people under the authority of the provincial chief, and superintended the police. But the superintendence of agriculture was the duty of a particular class of persons who attended to the embankments of tanks and canals, and to the distribution of water.

The kings were found in possession of a monopoly of cinnamon and other valuable productions, but the Portuguese, in 1597, permitted the people to trade in cinnamon on condition of their delivering one-fifth part of their collections to the government. This permission was withdrawn in 1626, and the Dutch, having dispossessed the Portuguese in 1656, introduced a more rigorous system, sacrificing every other consideration to the securing of monopolies of the productions and the labour of the people. Private trade in all articles bringing a profitable return was prohibited, and the laborious services to which the natives were [illegible] made them frequently abandon their lands, and [illegible] vigilance and severity were necessary to prevent [illegible] relinquishing the tenures by which they were called [illegible] work gratuitously for three months in the year. The British soon after obtaining possession effected [illegible] Some branches of external trade were liberated, an[illegible] customs were abolished. Public functionaries were paid by salaries instead of lands, and claims on the services of the people were commuted for assessed rents. Unfortunately for the country the exigencies of the Candian war led to re[illegible] of a demand on their services, and now all men of certain castes, excepting the inhabitants of Colombo and its neighbourhood, without reference to their possessions, are compelled to labour in public services at rates fixed by government. In 1818, soon after obtaining dominion over the Candian provinces, the commutation of gratuitous services for assessed rents, with a reservation to command the labour of the people at fixed rates of wages, was introduced there also. But the pernicious monopolies have at length been relinquished.

In September, 1832, the labourers of the soil hailed with delight the removal of their fetters, and set with spirit about their concerns. The Singhalese have availed themselves of the improvements which our matured knowledge and skill have introduced. The roads we have opened have been crowded with the vehicles of commerce. The novel institution of a savings' bank they resort to with confidence; cultivation has spread rapidly: and, generally, there are the strongest indications of indefinitely progressive prosperity.

This prosperity is accelerated by an improving administration of the civil and judicial affairs of the country; and more especially by the admission of the natives to a participation in its administration. Various reforms have been effected in the revenue and expenditure, in the system of taxation, and regulations of commerce. And, above all, the moral character of the people has been raised by education, and by their being made eligible to the dignities and emoluments of rank and office.

The government is at present carried on by a governor and two councils—executive and legislative. The executive council consists of a president, who is the governor; and of the following members: the officer commanding the forces, the colonial secretary, the treasurer, the king's advocate, the government agent of the central provinces. The legislative council consists of a president, who is the governor; and of the following members: the chief justice, the commander of the forces, the colonial secretary, the treasurer, the auditor-general, the government agent for the western provinces, the government agent for the central provinces, the surveyor-general. With the latter council are now associated six unofficial members, natives or naturalized subjects of Ceylon, being chief landed proprietors, or principal merchants. The governor, the commander of the forces, the chief justice, the king's advocate, and the surveyor-general, are appointed by the secretary of state from England. The others are ex-officio members of the councils; and they are appointed by the governor, subject to the confirmation of the secretary of state. Until lately it was incumbent on the governor to select them exclusively from the civil service, but this exclusive principle has been relinquished. Printed copies of proposed ordinances are sent to the members ten days before summoning the council, and publicity is given in the government gazette to regulations or laws, one month previous to their enactment. The protests of opposing parties are entered on the minutes. The laws after enactment are subject to the approval of the king in council. The governor may not authorize contingent disbursements exceeding 75*l.*, without the concurrence of his council. In his executive capacity the governor may act without referring to his council, but a record is kept of his proceedings, in the secretary's office, or in the department through which the measure is carried into effect. The regulations, translated into the vernacular languages, are made as public as possible.

With the exceptions above-mentioned, the principal official situations were filled by the civil servants alone, who were sent out by the secretary of state at an early age. Europeans, not of the civil service, and burghers engrossed the next inferior appointments; and Singhalese and Malabar natives were eligible only to a gradation of petty offices. The deficiency of other qualified Europeans led to the appointment of officers from the regiments in Ceylon to magistracies in the [illegible] districts, on small salaries in addition to their [illegible]; and they are found to conduct their duties with credit and efficiency. But an important change has been effected; and [illegible] present any individual whatever, possessing a competent knowledge of at least one of the native languages, and being otherwise duly qualified, may be appointed to the most [illegible] situation, without reference to service, nation, or religion; subject however to the confirmation of the secretary of state. Though vacancies in the civil service are not to be filled up, there remain however about [illegible] members of this corps who will continue subject for the most part to the regulations which affected them previous to the late change—and by their experience, talent, and qualifications, they will probably continue for a time to engross the higher offices.

The island is divided into five *provinces*, and each province is subdivided into *districts*. The provinces are denominated the Eastern, Western, Northern, Southern, and Central. In each province is stationed a government agent, and there are nineteen assistants to these agents, in various districts. These functionaries administer the affairs of government and officiate also as magistrates.

For the administration of justice throughout the island, there are, in the civil and criminal departments—a supreme court, established at Colombo; a vice-admiralty court, and provincial courts stationed in various districts; besides magistracies.

The powers of the supreme court are similar to those of the King's Bench and the High Court of Chancery combined. Justice is administered by three judges appointed from England. There is in this court—a king's advocate, with functions like those of the lord advocate of Scotland; a deputy king's advocate and registrar; and a proctor, who is a barrister, for pleading the causes of prisoners and paupers. By the generous and benevolent exertions of one of its former chief justices (Sir Alexander Johnson), trial by jury has been introduced. In 1811 it was enacted that every native tried before the supreme court for a criminal offence should be tried by a jury of his countrymen; and that the right of sitting on such juries should be extended to every native, whatever be his caste or religion. The beneficial effects of this measure have equalled the most sanguine expectations.

In each district there is a court held before a judge and three assessors; the judge is appointed by the crown and removeable at pleasure. The assessors are selected from amongst the inhabitants, duly qualified, not under twenty-one years of age. The crown reserves the right of appointing one permanent assessor to each district court. The officers of the district courts are appointed by the governor on the recommendation of the judge. The supreme court is held at Colombo, except on circuit. The district courts are held within their own respective districts. The district courts have civil and criminal jurisdiction. They try all offences except those punishable with death, transportation, or banishment, imprisonment for more than one year, whipping exceeding 100 lashes, or a fine of 10*l.*

The judgments of these courts are pronounced in open court. The judge states in the hearing of the assessors the questions of law and fact, and the grounds of his opinion. The assessors declare in open court their respective opinions and votes. If the opinion of the judge differ from that of the majority of the assessors, sentence is given according to the opinion of the former, but a record is kept of the votes of the several assessors. Appeals may be made from these courts to the supreme court; but in criminal cases execution of the sentence is not stayed by the appeal unless the judge see fit.

The criminal jurisdiction of the supreme court extends throughout the island. The sessions of this court are held twice a-year, in each circuit, by one of the judges; and at the civil sessions, on circuit, three assessors are associated with the judge: the criminal sessions are held before the judge and a jury. In civil suits the judge and assessors deliver their opinions as in the district courts. Sentence of death pronounced at the criminal sessions by the supreme court is not executed until confirmed by the governor. Appeals are allowed to the king in council. The Dutch or Roman law, with certain exceptions, is administered in both the district and the supreme courts. All the witnesses in criminal cases are paid by government.

There are four regiments of European infantry, two companies of the royal foot artillery, and a regiment composed principally of Malays, a very fine and efficient body of men, nearly 2000 strong, of approved courage and fidelity.

The ecclesiastical establishment is composed of an archdeacon, six chaplains (of whom two are natives), and eleven proponents.

There is a vaccine establishment, under the superintendence of the [illegible] [illegible] of hospitals; and great efforts are made by government to diffuse vaccination am[illegible] the people.

A savings' bank has lately been established at Colombo, under the patronage of government. Deposits of not less than one shilling, and not exceeding [illegible] pounds in the whole, during each and every year, are received and invested, and interest at the rate of five per cent. per annum is allowed to the depositors. When the principal and interest together amount to 200*l.*, the interest given to the depositors on the amount is reduced to three per cent. The bank places out the money received in deposit at seven per cent. interest. Its prosperity is such, that it has already paid off a government loan of 2000*l.*, and has now a surplus after paying all its expenses.

At Colombo, a regular police has been organized, upon the model of the metropolitan police of London; and in its working and efficiency it has fulfilled the most sanguine anticipations. The police of the island generally is good, and crimes are speedily followed by detection, more especially in the Candian provinces, where the village police is excellent. But the Singhalese being a quiet, docile people, crimes are rare, and remarkably so in the Candian provinces. In some of the maritime districts, the drinking of arack leads to a great increase of crime. The coroners' inquests held in 1834, were on — deaths, by falls from trees, 49; by falling into wells, 25; by drowning, 41; by falls from houses, 2; by guns bursting, 1; by accidental shooting, 3; by other casualties, 5: killed by the bites of serpents, 20; by elephants, 13; by wild hogs, 4; suicides by hanging, 18; by drowning, 6; by the violence of others, 13; by drunkenness, 8; by natural sickness, 14; total, 222.

There are seventeen prisons, capable of containing in all 1763 prisoners. The numbers of prisoners lately, were — for debt, 69 male, 2 female; for misdemeanours, 230 male, 38 female; for felonies, 639 male, 16 female.

Education.—For the progress of education the island is principally indebted to religious societies, and the exertions of missionaries. Submitting cheerfully to privations the most severe, discouraged by no obstacles or unfavourable appearances, they persevere in their benevolent labours, while churches, schools, and printing-offices have sprung up around them.

The great desire of the natives to acquire the English language has led to a modification of the course of instruction. Instead of their knowledge being limited to a few translations in an imperfect language, other works of a more useful kind have been introduced. A very creditable work in the English language, a gazetteer of the island, has been published by a native, and numerous others have acquired an extensive acquaintance with the learning of Europe.

In the year 1833, there were 17 government schools, 5 regimental schools, 221 missionary schools, 766 private schools; of which 63 were under the Roman Catholic clergy; total, 1009.

The government school system, which had become very inefficient, is at present under total revision, and therefore nothing can be stated with certainty respecting it, or of the numbers educated.

The church mission, established in 1818, have four stations: Cotta, Candy, Nellore, and Baddagamme. At the two last places they have seminaries, in which boys are boarded and educated gratuitously; and at Cotta there is a Christian institution where a select number of promising youths are qualified by a superior education to become assistant missionaries, or to fill other offices. In the schools of this mission are educated 1325 boys, 229 girls, 65 youths and adults; total, 1619.

The American mission commenced in 1816, and has at present seven stations in the Jaffna district. It has a seminary at Batticotta, containing 10 students in Christian theology; 84 in English and the elements of science; 20 pursuing the same branches through the medium of the native language; 8 day scholars: total, 129. It has also a central school at Oodooville for females. On the foundation, 51 girls are fed, clothed, and instructed. It has, in addition, other schools in eighteen parishes, containing 4241 boys, 821 girls; total, 5062.

The Wesleyan mission, South Ceylon district, established in 1814, educates [illegible] boys, 451 girls; total, 3491.

The Baptist mission, instituted 1812, educates about [illegible] children, of whom one-third are girls, in and about Colombo, in the principles of Christianity. The particulars of Roman Catholic schools are not known.

Money.—The British currency is in circulation throughout the island, and accounts are becoming generally kept in the same. The rix-dollar is = to 1*s.* 6*d.*, or = to 12 fanams, (a copper coin = to 4 pice.)

Inhabitants.—The first colonization of [illegible] is involved in obscurity. If the original inhabitants differed from the Hindu race, they have been either extirpated or so amalgamated as to be no longer distinguishable from them. The population is at present composed of Singhalese, Malabars, Mohammedans or Moors, a small proportion of Europeans and their descendants, and negroes. The Singhalese inhabit the interior and the sea-coasts, extending from Kamakan aar, bounding Mahagamphattoo, to the northern limit of Chilaw, and comprise the great body of the people. They are probably descended from the aborigines and the Gangetic nations, who invaded the island about 543 B.C. The language and customs of the Singhalese are in some respects peculiar. A woman was frequently married to all the brothers of the same family, but this practice is going out of fashion like many others. The civil distinctions of caste are strictly observed.

The abolition of the religious distinction of caste constitutes a remarkable peculiarity in the institution of the Buddhists.

The higher orders among the Singhalese belong exclusively to the caste of Gowiyo, and are distinguished by the epithet 'Handrow,' or gentleman. They are proud of long sounding titles and show, and the insulting distinction of superior and inferior castes is carried to a great length amongst them. Their occupations are purely agricultural; though the practice of agriculture is not confined to this class, but is exercised by persons of all castes. Different occupations are constantly followed by people of the same caste, but the intermarriage of persons of high and low castes is forbidden by the Candyan law, and many absurd distinctions are recognised and enforced, by which the latter are degraded and reduced to a servile condition, which becomes hereditary.

There is an exceedingly interesting class of natives, called Veddas, who inhabit the most secluded parts of the island, and derive their subsistence entirely from the natural productions of the soil and the forest, and from the chace. A cloth round the loins is the only clothing worn by them. Their habitations are, for the most part, small huts, constructed in the branches of trees, necessity having, doubtless, dictated the removal from a lower position, where their frail fabrics and their own lives must have been exposed to destruction by the herds of surrounding elephants.

The Singhalese are honest, sober, and polite, rendering a ready obedience to authority, and a pious attention to their relatives, particularly to those whose infirmities have made them helpless. They have been accused of being idle, deficient in courage and manly independence, and regardless of truth; but much of what has led to this accusation has resulted from the systems of religion and government under which their character has been formed.

The Malabars, or Tamuls, occupy the northern and north-eastern part of Ceylon, extending from Kamakan aar, bounding the Mahagampatoo, to the southern limit of Putlam, round by Jaffna. Their own traditions and the Singhalese annals inform us that they [illegible] invaders from the opposite coast, and formed a powerful kingdom in Jaffna, besides a number of petty states. The Malabars of Ceylon differ in nowise in personal appearance from those of the opposite coast, though in some points they differ from them in manners and customs. Those [illegible] Colombo are gradually taking up the manners [illegible] of the Europeans. Instead of sitting cross-legged on mats at meals, as formerly, they now sit on chairs at tables. Their meals are served up with regularity and neatness, and they no longer eat out of the same dish. Social [illegible], in the European style, are frequent, and lately, even [illegible] balls have been given. The Malabars are Hindus, [illegible] they have retained the religions, as well as the civil distinctions of caste, and the language and customs of southern India, under some modification, occasioned by their intercourse with the Singhalese; but they have not among them the tribe of Kshatriyas, though they recognise it in their classification.

The Mohammedans, or [illegible] d from the rerious neighbouring islands and the continent, with the converts they have made. They are found on all parts of the sea-coast, as well as in the interior. The [illegible] settlers [illegible] become so much amalgamated with their [illegible], that they are not distinguishable from them in appearance or language. They even tolerate the distinctions of caste, and class themselves into four orders: merchants, weavers, fishermen, [illegible] bankers. They are a fine, energetic, industrious race, who engross a large proportion of the commerce and traffic of the island.

The descendants of Europeans of unmixed blood, and that race which has sprung from the intercourse of Europeans with the natives, are called *Burghers*. From this class, almost exclusively, individuals have hitherto been selected for the clerkships in public offices, and for subordinate magistracies.

Religion.—Nicephorus supposes that St. Thomas, the apostle, preached the gospel in Ceylon; but modern writers agree in assigning to Nestorian missionaries, who accompanied the merchants from Persia, the introduction of Christianity into the island. From Cosmas Indicopleustes we learn that about the middle of the sixth century there were churches established here, but they no longer existed when the Portuguese arrived, and the permanent establishment of Christianity seems to have been effected by St. Francis Xavier, styled the apostle of the Indies. He preached in the neighbourhood of Manaar in 1544, and 600 of his converts fell martyrs to the faith which they adopted. Roman Catholics are more numerous than Protestants. Of the Protestants, those of the Church of England are most numerous. There are some Presbyterians, Lutherans, Methodists, and Baptists. Buddhism prevails in the interior, and generally among the Singhalese of the sea-coasts. It is said to have been introduced about 306 years B.C. from Pataliputra by Dambadiva. Their priests are regularly educated for the sacred office, and at the close of their prescribed studies they are appointed to it with great pomp. In their priesthood they have orders corresponding to those of archbishop, bishop, priest, and deacon. Any of its members may divest himself of his priestly character, and re-assume it again. This is effected by relinquishing and re-assuming his distinguishing robe under certain forms. On putting off the robe he becomes a layman in all his social and political relations, and remains such until he again puts on the robe. In conformity with the treaty of 1815, the Buddhist religion is maintained and protected in the interior by the British government, which still selects and appoints the priests; and the exhibition of the Daluda relic of Buddha, at Candy in 1828, was conducted by the British governor in person. The temple patronage, and the possession of the Buddha relic, were important privileges of the kings of Candy, to which the British government succeeded. But this interference in the religious affairs of the country has been attended with much inconvenience: it has failed to satisfy the chiefs, and it has checked the improvement of the country and the advancement of the people.

In the northern parts the Hindoo religion prevails, but its professors are the followers of Siva.

Language.—The spoken language of the Singhalese is peculiar to themselves, but their classic and sacred writings are either in Pali or in Sanscrit. The Malabars use the Tamul, both for colloquial and literary purposes—excepting the Brahmins in Jaffna, who write Sanscrit in the *grantha* characters. The Ceylon Portuguese prevails in the European settlements, but its use is not universal among the natives. The Singhalese have among them, besides works on the life and do[illegible] of Buddha, many books in verse and prose common to [illegible] nations. They have also a history of the kings of Ceylon [illegible] the first commencement of the Vejayan dy[illegible] Malabars possess complete Tamul versions of various works of celebrity in the East, besides numerous original works on various subjects. Many works have lately been written by converts to Christianity in imitation of the literature of their rulers, which have reference [illegible] scenes and events of Europe, with which in their literature as in other things, they seem anxious to iden[illegible]selves.

The [illegible] have assiduously cultivated the Tamul.

Population.—The numerous remains of works of art scattered over the country demonstrate that the island was once much more populous than at present. Some districts, once flourishing, are [illegible]ntirely depopulated, and the population in all has grea[illegible]minished, with the exception [illegible] Galle, Jaffna, [illegible]e maritime provinces the population is now increas[illegible] was in 1814 [illegible] in [illegible] 18[illegible]98,611. According [illegible] Co[illegible]tion in 1824 was, in the [illegible] Singhalese provinces, 399,408; in the northern [illegible] districts, 195,697; and in the interior or Candian, [illegible]; total, 832,940. In 1833 the total population amounted to 1,126,808, being 46 to the square mile; of whom there were employed in agriculture 354,459; in manufactures, 25,017; in commerce, 47,102. The births in 1833 were 2[illegible],654; the marriages, 8899; the deaths, 22,380—except for the following divisions, where no registers of births, &c. have been kept—Four Corles, Saffragam, Bintenne, Nuwerakulawa.

Commerce.—We have historical proof that, from the Christian æra until the beginning of the 6th century, Ceylon was the emporium of the trade carried on between Africa, India, and China. The Romans particularly, after the discovery of the passage by way of Babelmandeb to Guzerat, by Hippalus, until the decay of their empire, traded extensively with India and Ceylon; the latter place being the usual limit of their navigation, where they exchanged their gold and silver, the chief instruments of their commerce, for the silks, fine cloths, and costly commodities of Eastern India and China. This trade was afterwards engrossed by the Persians, the principal part of whose imports consis[illegible] horses for the king. The persons on the island eng[illegible] this trade were settlers—Arabs, Persians, Malabars, [illegible]essively. The great commercial ports were Colombo and Galle, though grain and provisions were exported in abundance from Trincomalee to the opposite coast.

We are led back to the state of Ceylon before the Christian æra by Pliny's quotations from Eratosthenes and other Greek geographers. The great source of their information seems to have been the mission of Megasthenes to Palibothra on the Ganges.

Pliny mentions the season favourable to the sailing of vessels at the Ceylonese ports to be during three months. Nearchus informs us that, on entering the Persian Gulf, he saw the promontory of Maketa (Muscat, or, more probably, Cape Mussendom), whence cinnamon and other things of the kind were conveyed to Babylon. We may infer that they were first taken to Muscat from Ceylon (Indic. 32).

In the 11th century the trade was entirely in the hands of Mohammedan Arabs, who circulated its productions through the Red Sea and Persian Gulf, and various countries of Asia, Europe, and Africa.

The vast commerce of Ceylon was not materially checked till the Portuguese engrossed the trade of its principal productions, and interrupted those maritime relations which had existed previous to the discovery of the passage round the Cape of Good Hope. But it was reserved for the Dutch system of pernicious monopoly to inflict vital injury on its commercial interests. The narrow policy or individual interest of the Dutch governors shackled the commerce of the island, and almost destroyed her natural powers of production. These impolitic restraints are being totally removed; though it may be still long before Ceylon will cease to feel the effects of the evils which she has suffered from misgovernment in her commercial affairs.

The value of exports in 1833 was estimated at 132,530*l.*; of imports at 320,891*l.* The quantities of some of the principal articles exported were, cinnamon, 77,530 bales. Oil, 112,671 gallons; coffee, 30,449 cwts.; coir-rope, 10,790 cwts.; arack, 3256 leaguers. The quantities of the principal articles of import were, rice, 775,593 parrahs; paddy, 438,617 parrahs; wheat, 34,879 parrahs; other grain, 10,108 parrahs. Cloth, in value, 81,194*l.* It may be mentioned here, that edible birds' nests, so much prized in China, have been found in Ceylon, and there is reason for inferring that they exist there in abundance, and will hereafter be exported to China.

The Dutch, in pursuance of their system, having acquired possession of the entire sea-coast, controuled the supply to the interior of salt and other commodities; and instituted customs and transit duties, which, together with the difficulty of transport, caused the inland trade to be very inconsiderable. Since the construction of roads, and the abolition of customs and transit duties by the British, the inland trade is rapidly increasing, and the [illegible] are exposed for sale in every village. [illegible] Candian provinces consist principally of grain, coffee, jaggery, and [illegible]ts; the [illegible] is cons[illegible] principally of salt, salt fish, a[illegible] goods.

The gross revenue of Ceylon has for some years averaged somewhat more than 330,000*l.* per annum. But the abolition of the cinnamon monopoly and other changes lately effected, render it impossible to estimate the probable net revenue. The revenue brought to account in 1834 was 292,554*l.*

Items of Revenue for 1833.

	£	s.	d.
Cinnamon	£165,270	0	6
Sea customs	64,419	12	4
Pearl fishery at Condatchy	25,043	10	0
Land rents	36,624	1	7
Land customs	5,222	1	10½
Licences	33,322	4	6
Auction duty	182	4	9
Salt farms	29,044	12	5½
Fish farms	6,479	14	7
Tobacco tithes	174	12	3½
Commutation tax*	1,799	17	9¼
Blank stamps	3,121	0	0½
Stamps and fees in supreme court	10,172	5	6¼
Post office	1,823	8	10¼
Chank fishery	13	10	0
Pearl oysters—sale of, at Trincomalee	2		
Total fixed revenue	382,715	2	1¾
Arrears of revenue of former years	5,263	4	0¾
Incidental	47,318	5	2¾
Receipts in aid of revenue	2,258	16	6¾
	£437,555	8	0

The revenue derived from land is collected in kind, and the grain is stored for the use of the troops and for sale. The importance of the cocoa-nut tree is shown by the superior revenue which it returns. In 1832, while the revenue derived from the tax on rice lands was about 21,300*l.*, that derived from the cocoa-nut tree amounted to 35,773*l.*, of which the following are the items:—Distilling of arack 3644*l.*; retail of do. 24,975*l.*; export of do. 3136*l.*; do. of coir rope 153*l.*; do. of jaggery 162*l.*; do. of copperahs 1530*l.*; do. of cocoa-nuts 1551*l.*; do. of cocoa-nut oil 413*l.*

The revenue on cinnamon is now collected on the export, instead of being a monopoly of the sale as formerly. The fish rents are raised by a duty of 10 per cent. on all fish caught. The revenue from the pearl fishery in the Gulf of Manaar is very precarious. The average annual amount for 32 years, ending in 1832, was 14,662*l.* The net revenue from the same source paid into the treasury, during the nine previous years, had, in 1834, amounted to 145,000*l.* The net profit realized by government, in 1835, was 38,000*l.* In 1816 the Chank fishery produced 6700*l.*; its produce is now no longer worth taking into account. The gross revenue derived from salt is about 29,000*l.*, but the cost of realizing it is 20 or 25 per cent.

The sea customs in 1833 amounted to 64,419*l.*; exports 132,530*l.*; imports 320,891*l.* The progressive abolition of the export duties is an object of the present government, which they are rapidly carrying into effect, and a great improvement in agriculture and commerce will doubtless result.

For a long time after the British took possession of Ceylon, in consequence of internal wars and of the hostilities waging in Europe and on the continent of India, the revenue of the island was inadequate to meet the expenditure. But the revenue had of late years exceeded the expenditure until the year 1834, when the excess of expenditure amounted to 24,970*l.* This excess was met by surplus funds in the colonial chest: and the returns for 1835, not yet received, must show a considerable surplus revenue, when swelled with 38,000*l.*, proceeds of the pearl fishery, and a considerable increase of cinnamon duty. The total expenditure for 1834 was 317,524*l.*, of which about 32,958*l.* was expended by the agent in England.

Since the late revision of government offices and retrenchment, the scale of salaries of official functionaries in Ceylon is at least as economical as an enlarged and enlightened policy can admit. The practice of the Dutch was to remunerate their servants with salaries inadequate to place them above temptation, in consequence of which they plundered the people to such an extent that, up to the present time, the [illegible] suffering from the effects of this pernicious [illegible] administration.

Expenditure for the year 1833.

	£	s.	d.	£	s.	d.
[illegible]ars—						
Civil	£7200	15	[illegible]			
Military	4996	11	6¼			
				[illegible]97	7	2
Civil expenditure—						
Ordinary	104,243	10	11¼			
Extraordinary	85,424	18	4¼			
Losses	598	4	9¼			
				190,266	14	1¼
Military expenditure—						
Ordinary	57,153	10	8¼			
Extraordinary	5878	15	8¼			
Commissariat—Salaries	2[illegible]8	12	2			
Contingencies	30,872	1	11			
				96,343	0	6
Total				£298,807	1	9¼

The British standard avoirdupoise weight is adopted throughout the island.

(*History of Ceylon*, by Robert Knox; Bertolani's *View of the Agricultural, Commercial, and Financial Interests of Ceylon*; *Ceylon Almanac*, 1832–35; *Colombo Journal*, 1832–34; *Ceylon Gazetteer*; Strabo, book xv., p. 690, Casaub; Pliny, *Nat. Hist.*, vi., 22; Ptolemy, book viii.)

CEYX. (Zoology.) [KINGFISHERS.]

CHABLAIS, a province of Savoy in the Sardinian States. It extends along the S. coast of the lake of Geneva, and inland as far as an offset of the Alps, which detaches itself from the lofty mountain called La Dent du Midi, on the borders of the Valais, and running in a W. direction divides the sources of the river Dranse, which flows N. into the lake, from the waters of the Giffre, an affluent of the Arve, which flows W. into the Rhone below Geneva. The Chablais is bounded on the S. by the province of Faucigny, of which the valley of the Giffre forms part; on the W. by the Canton of Geneva, and on the E. by the Valais. The length of Chablais from St. Gingouph, on the borders of the Valais, to Hermance, on those of Geneva, is 27 miles, but the distance is considerably greater by the road, which follows the curve made by the shore of the lake. This road is part of the great Simplon road made by order of Napoleon. The greatest breadth of the province, N. to S., from Evian to the sources of the Dranse is about 21 miles. The area, according to Neigebaur, is 377 square miles, and the population in 1824 was 48,819 (*Calendario Generale dei Regi Stati*). It is a very mountainous country, with the exception of a strip of land along the shore of the lake of Geneva, which produces corn, wine, and fruit, but its N. aspect renders it less favourable to production than the opposite coast of the Canton de Vaud. Several narrow valleys run inland between the offsets of the Alps, along the course of the Dranse and of its affluent These valleys abound in rich pastures, on which [illegible] herds of cattle are fed. Very good cheese is m[illegible] part of the country, both for consumption and [illegible]tation. The country abounds also with ches[illegible] walnut trees. The principal towns of the Chablais are the following:—1. Thonon, built on an eminence above the lake, in the midst of a fine and well-wooded country, is the residence of the intendente, or governor of the province, has a Tribunale di Prefettura, or court of justice, subject to appeal to the senate at Chambery, a royal college, and a convitto for student boarders, several churches and convents, a handsome town-house, an old castle, and about [illegible] inhabitants. At Ripaille, near Thonon, is the [illegible] handsome convent founded by Amadeus VIII., [illegible] Pope Felix V. The building and grounds, including a handsome park, were sold by auction under the French. The building has been sadly dilapidated, and the church, rich in marbles and stuccoes, was for a time used as a hay [illegible]. The present occupiers have made a villa of it, [illegible]ded by rustic dwellings for the [illegible]. ([illegible] in *Savoja*, 1828.) 2. Evian, a small town, [illegible] coast of the lake, nearly opposite Lausanne, in [illegible], has about 1800 inhabitants. Between Thonon [illegible], on the right bank of the Dranse, [illegible] the mineral waters of Amphion, which were much frequented in the [illegible] century by visitors from Geneva. Inland, among the Alps, is the village of Abondance with 1400 inhabitants, in the valley of the same name, so called for the richness of its pastures.

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* Since abolished.

Its abbey, founded by St. Columbanus in the beginning [illegible] the sixth century, as well as another [illegible] of Bernardines at St. Jean d'Aulps, in a neighbourin[illegible] now [illegible]pressed. On the [illegible] of the lake [illegible] borde[illegible] Valais, was a town called Tauretunum, which [illegible] destroyed by the fal[illegible] mountain, A.D. 563. The rocks of Meiller[illegible] celebrated [illegible]usseau, are in this neighbour[illegible] highest su[illegible] in the Chablais are the Dent d'Oche, the borders of the Valais, 7000 feet above the sea; the Co[illegible] de Jouxplane, a corruption of Jovis planities, or the plain of Jupiter, which rises between the Chablais and Faucigny above the valley of the Giffre, and is about 10[illegible] feet higher than the Dent d'Oche; and the Roc d'Enfer, which rises above the valley of the Dranse, near the centre of the province, and is about the same height as the latter. (Keller's *Map of Switzerland*.)

CHABLIS. [YONNE, DEPARTMENT OF.]

CHA'BRIAS, a distinguished Athenian general, who, in B.C. 388, sailed to Cyprus to assist Evagoras in the reduction of the island (Xen. *Hell.* iv., 8. 24), of which his father had been deprived by the Persians. In B.C. 376 he gained the sea-battle at Naxos. (Demosth. *Aristocrat.*, p. 686; Clinton, *Fast. Hell.*) In 373 he and Callistratus acted as colleagues of Iphicrates at Corcyra. (Xen. *Hell.* vi., 2. 39.) He was despatched to settle the affairs of Thrace in 360. (Demosth. *Aristocrat.*, p. 677.) In 357 Chabrias and Chares were sent from Athens with an army to besiege Chios, which, with Rhodes, Cos, and Byzantium, had revolted. (Diodor. Sic. xvi., 7.) Chares led the land forces and attacked the walls from shore. Chabrias no sooner approached the harbour than he engaged in a desperate sea-fight; his ship was shattered by the enemy; most of his men escaped, but the general himself preferring, as Diodorus says, a glorious death to a disgraceful surrender, fell fighting. (Diod. Sic. xvi., 7; Corn. Nep., c. 4.)

CHÆRONE'A, an old city of Bœotia, on the borders of Phocis, near the pass which led to Delphi by Panopeus and Parnassus (Thucyd. iv. 72); it was twenty stadia from Panopeus (Pausan. x. 4). The name of this place does not appear in Homer's catalogue; Pausanias, however, conjectures (ix. 40, 3) that it is a later name for Arne, which stood on the same ground. It is principally celebrated for two battles fought here; one in which Philip of Macedon signally defeated the united forces of Athens and Thebes; the other between Sulla and Mithridates, in which the Romans gained a decisive victory. During the Peloponnesian war it was tributary to Orchomenus (Thucyd. iv. 76); but in later times it was one of the confederate Bœotian towns (Pausan. ix. 3, 4). Its situation was the cause of much good and evil to it; on the one hand its neighbourhood to the pass exposed it occasionally to plunder (Thucyd. i. 113); while on the other hand, as the main road from Rome to Athens passed through it, many of the advantages of the carrying-trade accrued to it. Pausanias tells us (ix. 41) that its inhabitants derived a great profit from the cultivation of the olive, and the manufacture of perfumes from flowers. The site is now occupied by [illegible] Caprena (Walp. *Mem.*, p. 342) or Capurno (Dodwell, i. p. 221), where there are remains of a theatre and other buildings. According to Gell's *[illegible]erary* (p. 222), the town lies about an hour's ride south [illegible] the Cephisus. It was the birth-place of Plutarch.

CHÆ[illegible]ODON (Linnæus), a genus of fishes of the section Acanth[illegible] and family Squammipennes. Technical characte[illegible] body compressed: mouth small, furnished with several [illegible]-set rows of long slender bristle-like teeth.* The [illegible] which are usually confined to the body) in this genus [illegible] on to the dorsal and anal fins, so that it is difficult to [illegible] the latter commence.

These [illegible] abound in the seas of hot climates, frequent rocky shores, and [illegible] adorned with beautiful colours. Their most common [illegible] appear to be black and yellow, but brilliant [illegible] blues and greens, of various hues, are not unfrequent. [illegible] of the species have a vertical black band in [illegible] eye is placed. In [illegible] there are several similar [illegible] on the body; in others the body is spotted, or [illegible] oblique or longitudinal bands. They have a [illegible]; their intestines are long and ample, and their [illegible] are numerous, long, and slender. Their flesh is [illegible] eating.

The species are numerous and [illegible] been divided into several [illegible]bgen[illegible] [illegible]hose to which the [illegible]ætodon [illegible] restricted have the body more or less [illegible]al, the rays of the dorsal fin forming a tolerably unif[illegible], the snout more [illegible] produced, and the pre-o[illegible]um sometimes furnished with [illegible] tooth.

In some [illegible] section, one or more [illegible] the soft rays of the [illegible] fin are [illegible] produced and form a long filament; and [illegible]hers are distinguished by their having very few spines to the same fin.

Chætodon vagabundus, a species which inhabits the coasts of Ceylon, has the body of a pale yellow colour, with numerous oblique brownish-purple lines; the dorsal fin is blackish, and has thirteen spinous rays; the caudal fin, or tail, is yellow with two black bands; the anal fin is blackish with a yellow curved longitudinal band; its margin is also yellow; a broad black vertical band extends through the eye; and the part anterior to this band, as low down as the eye, is of a pinkish hue with yellow streaks. Its length is from six to twelve inches, the scales on the body are large, those on the head are rather small.

[Chætodon vagabundus.]

The next subgenus, *Chelmon* (*Les Chelmons*, Cuv.), is distinguished by the form of the snout, which is much elongated, open at the end only, and formed by a great elongation of the intermaxillary and under jaw-bones.

C. rostratus, a species which inhabits the fresh waters of India, is of a silvery hue and has five brownish bands; the posterior part of the dorsal fin is furnished with a black spot encircled with white.

This fish feeds upon insects and is remarkable for its mode of procuring them. When it observes a fly or any other insect on a weed, or hovering over the water, it ejects a little drop through its tubular snout with such precision as frequently to disable the little animal, so that it falls into the water and is devoured.

In those parts where *C. rostratus* abounds it is frequently kept in vessels of water, and affords much entertainment by the dexterity displayed in shooting at flies which are placed on the vessel for the purpose; it generally approaches to within five or six inches before the drop of water is ejected.

The subgenus *Heniochus* differs from the true Chætodons in having the anterior spines of the back produced into a long filament which is sometimes double the length of the body.

Ephippus may be distinguished by the species having the dorsal fin deeply cleft between the spinous and soft portions. The spiny portion, which is scaleless, when not erected, is received into a groove formed by the scales of the back.

Holocanthus, the species of this subgenus, have a large spine on the angle of the preoperculum, and most of them have the edge of the same bone serrated; they are found both in the Atlantic and Pacific Oceans.

The next subdivision, *Pomacanthus*, have the body of a more elevated form, [illegible] to the sudden rising of the anterior margin of the [illegible] fin. The only species kn[illegible] are from the American coasts.

In the last subdivision, *Platax*, [illegible] be known by the extremely compressed form [illegible] large vertical dorsal fin (which has the [illegible] almost concealed in the [illegible]brane), [illegible]g ventral fins, an[illegible] Here, in addition to the fine, thickly set teeth, there are in front which are [illegible] and each of them [illegible] di[illegible] into three points.

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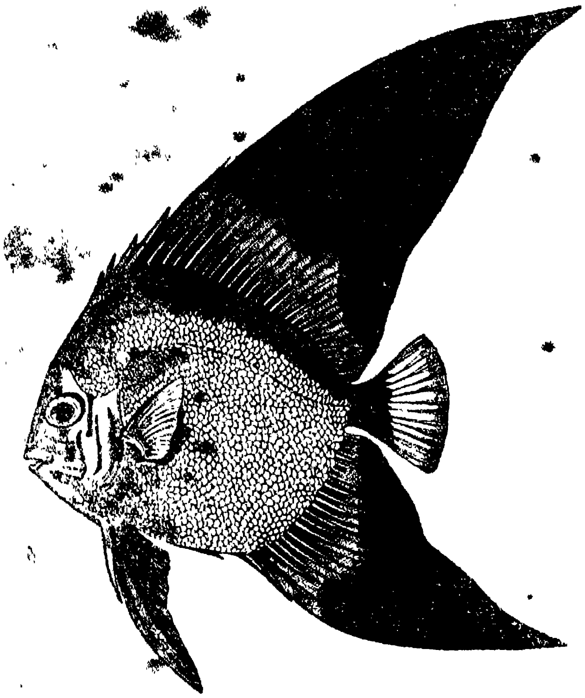
* [illegible] genus received its na[illegible] this character of teeth, being derived [illegible] ([illegible]) hair, and [illegible] (genitive [illegible]) a tooth.

All the species [illegible] this section are found [illegible] the Indian Ocean; one has been found in a fossil st[illegible] [illegible]nt Bolca.

Platax vespertilio will afford an example of this sectio[illegible] It is found off the coast of Ceylon, and is of a yellowish colour; the dorsal, anal, and ventral fins are brownish, the back is also mottled with the same colour, and a dark band extends downwards through the eye; the base of the caudal fin is dark brown. This species grows to a large size, and is found in rocky situations, but more commonly in deep water.



[Platax vespertilio.]

The two species of Chætodons, of which figures are here given, have been selected from Mr. J. W. Bennett's 'Fishes of Ceylon,' a work illustrated by beautiful coloured plates. (Cuvier's *Règne Animal*; Lacépède, *Histoire Naturelle, &c., des Poissons*; Bloch, *Histoire Naturelle, générale et particulière, des Poissons*.)

CHAFFINCH. The English name for the well-known species of *Fringilla*; Σπίζα (Spiza) of Aristotle and the Greeks; *Fringilla* and *Frigilla* of Gesner and others; *Franguello, Franguèglio, Fringuello*, and *Spincione* of the Italians; *Pinson, Pinçon, Grinson*, and *Quinson* of the French; *Fink*, or *Buch-fink* (Beechfinch), *Edelfink, Gemeine Fink, Schild vink* of the Germans, &c.; *Fincke* and *Bofincke* of the Fauna Suecica; *Asgell arian*, *Wine* of the ancient British; *Fringilla cœlebs* * of Linnæus.

We should have referred this pretty bird to the article *Fringillidæ*, were there not some qualities belonging to it which seem to be not very well known in this country, that make it worthy of a more particular notice. As far back as the time of Belon its powerful voice was remarked. 'On [illegible] garde en cage pour les faire chanter, dont le chant est si [illegible]ant, qu'il en est fascheux, (folio 1555)—and in the small quarto (1557) the following quatrain is printed under the figure of the bird:—

Pour bi[illegible]n pin[illegible] lon me nom Pinson,
Qui ay l[illegible] [illegible]x fort haultaine et puissante,
Je hay le chauld, froidure m'est plaisante;
En ce contraire est è tous ma façon.

'The passion for this bird,' says Bechstein, in his *Cage Birds*, 'is carried to such an extent in Thuringia, and those which sing [illegible] sought for with so much activity, t[illegible] [illegible]arely [illegible] that warbles tolerably can found throughout the province. As soon as one arrives in a neigh[illegible], country whose notes appear good, all the bird-[illegible] after it, [illegible] give up the pursuit till [illegible] have taken it. This [illegible]e reason why the chaffinches in this province are so indiff[illegible] songsters; the young ones have only bad masters in [illegible] ones, and they in their turn cannot prove better.'

In England, however, it appears to have been appreciated. The Hon. Daines Barrington, in his paper 'On the small Birds of Flight' (the bird-catcher's expression), observes that the greatest sum he ever heard given for [illegible]ng-bird which had not learned to whistle tunes, was [illegible] guineas for a chaffinch that had a particular and [illegible]n note, under which it was intended to train [illegible]. The same author observes, in his memoir 'On the Singing of Birds,' that the bird-catchers prefer the song of the Essex chaffinches.

Bechstein, after describing the different notes that express its passions and wants, among which the often-repeated cry, *fink, fink* (our *twink*), from which its German name is derived, he considers to be mechanical [illegible] involuntary, thus speaks of its powers. 'But what makes it appear to still more advantage among other birds are its el[illegible] trilling tones, that seem almost to approach to wo[illegible] fact, its warbling is less a song than a kind of *battement*, to make use of a French word, and is expressed in German by the word schlag (trill), which is used to designate its song as well as the nightingale's. Some chaffinches have two, three, four, even five different battemens, each consisting of several strains, and lasting several minutes. This bird is so great a favourite in Germany, that not a single tone of its voice has escaped the experienced ears of our bird fanciers. They have observed its nicest shades, and are continually endeavouring to improve and perfect it. I confess I am myself one of its warmest admirers; I have constantly around me the best songsters of its species, and if I liked, could write a good sized volume on all the details of its music.'

The following chaffinch songs, or melodies, are most esteemed in Saxony and Hesse. Some are heard in the woods, but they are rarely sung with a clear and strong voice. If the bird executes well, and adds to the last strain the sound '*fink*,' which the German bird-catchers translate by *amen*, it is of the highest value. 'No price,' says Bechstein, 'will be taken for it.'

1. The 'Double Trill of the Hartz,' in Lower Saxony. 2. The 'Reiter zong,' or 'Rider's Pull,' first heard among the mineral mountains of Saxony and [illegible]tland. 3. The 'Wine Song,' with the following subdivisions, viz.:—The 'Fine,' or 'Längsfeld Wine Song;' the 'Bad Wine Song,' and the 'Sharp Wine Song,' which is subdivided into the 'Common Sharp,' and the 'Ruhl Sharp.' 4. The 'Bräutigam,' or 'Bridegroom Song,' also divided into good and bad. 5. The 'Double Trill.' One of these, the 'Double Trill' [illegible]t Iamblach, is only to be acquired in the house, and is so deep and powerful that it can scarcely be conceived how the larynx of so small a bird can produce such sounds. [illegible]stein, who makes this observation, adds, that a [illegible] which sings this either alone, or with the good 'Bridegroom's Song' (such as are educated at Iamblach), sells at Waltershausen for 18 French francs. 6. The 'Guitar,' or 'Good Year Song,' with two subdivisions. Chaffinches singing this, united to the 'Wine Song' of Ruhl, or the 'Sharp Song,' had become very rare when Bechstein wrote, and fetched high prices. 7. The 'Quakia Song,' formerly much admired. Bechstein says, 'I believe I possess the only bird that is now to be found which sings this. [illegible] be admired, the 'Quakia' must be united with [illegible] double trill. This my chaffinch sings also.' 8. The [illegible] or 'Trewethia,' a very uncommon and agreeabl[illegible] never heard but in the depths of the Thuringian [illegible]

Our limits will not permit us to do more than give the following account of the first and most esteemed of these songs, 'The double Trill of the Hartz,' from Bechstein. This 'is composed of six strains, rather long, the last of which is ended by dwelling on the tw[illegible] [illegible], which I shall express here,' says Bech[illegible]tein, 'by the word *weingeh*.* I doubt if ever a [illegible] in its wild state has executed this so perfectly as I he[illegible] it at Ruhl, and at my own house. Art has certainly [illegible] it. It is with difficulty that a chaffinch attains [illegible], with the best abilities, if it has not been instructed from its [illegible] youth. Rarely can it give it complete without leaving any part out. [illegible] account a high price must be given [illegible] little prod[illegible] that sings it through [illegible] entire, and [illegible] strength. Ruhl, Bechstein a[illegible] in a note, is a large manufacturing village in Thuringia, the inhabitants of which, mostly cutlers, have such a passion for chaffinches that some have gone nine [illegible] from home to take with bird-lime one of these birds distinguished by its song, and have given o[illegible] of their cows for a fine songster: whence has arisen their common expression, 'such a chaffinch is worth a cow.' A common workman will give a louis d'or (sixteen shillings) for a chaffinch he admires, and willingly live on bread and water [illegible] gain [illegible] money. An amateur cannot hear of one that sings in a superior style 'The double Trill of the Hartz' without being in an ecstacy. I have heard them say that one which sings this melody perfectly can certainly converse, from its pronouncing the syllables so distinctly.'

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* Professor [illegible] [illegible]tion of Montagu's Dictionary' has changed the [illegible] name [illegible]. The Rev. L. Jenyns in his 'Manual of British Vert[illegible] Animals' has restored the Linnæan name adopted by most naturalists.

* 'Literally,' says the translator, 'to go to the win[illegible] [illegible].'

For the different modes of capturing this pretty bird, so precious when in perfect song to the bird-fancier, its treatment in confinement, the diseases to which it is subject, and their remedies, we must refer the reader to Bechstein's little book above quoted; but we must notice one peculiarity, viz., the necessity of teaching them their song every year.

The following description—and the bird is so common that a more particular one is unnecessary—is from the interesting 'Journal of a Naturalist:' 'The male bird is remarkable for the cleanliness and trimness of his plumage, which, without having any great variety or splendour of colouring, is so composed and arranged, and the white on his wings so brilliant, as to render him a very beautiful little creature. The female is as remarkable for the quiet unobtrusive tintings of her dress; and when she lies crouching on her nest, elegantly formed of lichens from the bark of the apple-tree, and faded mosses, she would hardly be perceptible but for her little bright eyes that peep with suspicious vigilance from her covert.' Temminck says, that in autumn after the moult, the colours of the plumage of the male are more bright than they are in the spring, because all the feathers of the upper and lower parts are terminated by a clear ash-colour; and, at the season of love, the male bird's dress becomes decked with pure and brilliant colour, without the aid of a second moult, the edges of the barbs being worn away with use, and thus suffering those colours which had been hidden to appear in all their beauty.

Varieties.—Pure white, yellowish white, some parts of the body white. The usual colours with a white collar; wings and tail white. Aldrovandus mentions one partly yellowish and partly blackish.

Geographical Distribution.—Temminck says that it inhabits almost all the countries of Europe; that it is permanent in the southern parts, and a regular bird of passage in the greatest number of localities. C. L. Bonaparte, prince of Musignano, says that it is very common near Rome, and makes its passage in October, when numbers of them are taken for the table among other small birds at [illegible] and Roccolo, but in much the larger proportion, 500 chaffinches being, according to the prince, captured to every 80 linnets, 65 goldfinches, 30 green grosbeaks or greenfinches, &c. &c. Selby thus speaks of its migratorial habits: 'All the British ornithologists describe this species as permanently resident with us, and nowhere subject to that separation of the sexes, and the consequent equatorial movement of the females, which is known to take place in Sweden and other countries. The fact, however, is otherwise, as the experience of a series of years has evinced that these birds, in a general point of view, obey the same natural law in the north of England. In Northumberland and Scotland this separation takes place about the month of November, and from that period till the return of spring, few females are to be seen, and those few always in distinct societies. The males remain and are met with, during the winter, in immense flocks, feeding with other granivorous birds in the stubble lands as long as the weather continues mild and the ground free from snow; and resorting, upon the approaching storm, to farm-yards and other places of refuge and supply. This separation of the sexes I am induced to believe takes place in many other species, with respect to their migratory movements, as I have before remarked in the account of snow-bunting. This appears also to be the case with the woodcock, having observed that the first flight of these birds (which seldom remains longer than [illegible] to recruit, and then passes southward) consists [illegible] of females; whilst, on the contrary, the subsequent and latest flight (which continue with us) are principally composed of males. It has been noticed by several authors that the arrival of the males, in a number of our summer visitants, precedes that of the females by many days; a fact from which we might infer that in such species a similar separation exists between the sexes during their equatorial migration.' Knapp (*Journal of a Naturalist*) says, 'With us (Gloucestershire) the sexes do not separate at any period of the year, the flocks frequenting our barn-doors and homesteads in winter being composed of both.' In the northern parts of Europe, however, the females are said to migrate to milder regions, which induced Linnæus to bestow the name of *cœlebs* upon this species. White observes upon the vast flocks which he saw near Selborne towards Christmas, all of which were hens. Jenyns says that it collects in flocks at the approach of winter, but makes no mention of the separation of the sexes. In Middlesex we have seen in winter flocks composed mostly of females, but we have also seen both sexes, about Christmas, partaking with other little winged pensioners of the crumbs daily thrown out for their support.

Food, &c.—Seeds principally. We are compelled to add that they are very injurious to the florist and gardener. 'These birds,' says Knapp, 'make sad havoc with some of our spring flowers; and the polyanthus, in Mar[illegible] sheltered borders, is very commonly stripped of all [illegible]soms by these little plunderers, I suppose to obtain the immature seeds at the base of their tubes. * * * * At this period too they are sad plunderers in our kitchen gardens, and most dexterously draw up our young turnips and radishes as soon as they appear upon the surface of the soil; but after this all depredation ceases, the rest of their days being spent in sportive innocence.' Selby says that in summer it feeds much upon insects and larvæ, and that he has witnessed its assiduity, during the autumn, in devouring the females of a large species of aphis, that infests the trunks and stronger branches of the larch and some other kinds of fir. In winter, he adds, grain and other seeds constitute its food.

Nest, &c.—One of the most beautiful, and, as Selby observes, always accordant with the particular colour of its situation.* It is variously placed in trees and bushes. In orchards, an old apple tree is a favourite situation. Eggs, four or five, bluish white tinged with pink and marked with streaks and spots of purplish-red.

This bird is hardly known by the appellation of chaffinch in some countries, and we therefore give its provincial names: spink, beechfinch, pink, twink, skelly, shell-apple, horsefinch, scobby, shilfa.

CHAGRE, or, according to Lloyd, Chagres, is a river in the republic of New Granada in South America. It traverses in a longitudinal valley a considerable portion of the Isthmus of Panama, rising in about 79° 10′ W. long., and 9° 10′ N. lat., among the high mountains which approach the Bay of Mandinga. Its course is westward: nearly opposite the town of Puerto Bello it receives the Pequeni, which comes from the S.W., and is as large and broad as itself. After this junction the river is considerable, and may be navigated by canoes; but the navigation is dangerous owing to the number of falls or rapids, in some of which the stream runs with extraordinary velocity. This rapidity gradually diminishes, and at Cruces, a small town situated 23 miles direct distance from the sea, and 44 by the river, it seldom exceeds 3 or 3½ miles per hour, even in the rainy season. Here the river becomes navigable for large river barges. It afterwards gradually declines to the N., sensibly diminishing in rapidity, and enters the Caribbean Sea at Chagre, a small sea-port [illegible] 80° 10′ W. long., with about 1000 inhabitants of a mix[illegible] race. The whole course of the river hardly exceeds 80 or 90 miles.

This small river has acquired considerable importance by having become the means of facilitating the commercial intercourse between Europe and the countries of South America on the Pacific Ocean. The road between the towns of Puerto Bello and Panama is a series of steep ascents and descents, and quite impracticable during the rainy season. This circumstance, added to the extremely unhealthy climate of Puerto Bello, has been [illegible] of the entire abandonment [illegible] road [illegible] in its place a [illegible] communication [illegible] opened between Panama and [illegible]. The goods are brought on mules from Panama to Cruces, where they are embarked in river-barges of considerable burden, and carried to the town of Chagres. The port is a little sandy bay, with a ledge of rocks across its entrance, which has not more than 15 feet water in the deepest places, and in many parts rises to the surface. Though the transport of articles by this way is rather expensive, it is still used for goods which are not too bulky or heavy, and is likely to continue until a more easy and expeditious communication is formed. (Lloyd in *Lond. Geogr. Journ.*; Humboldt; Haigh.)

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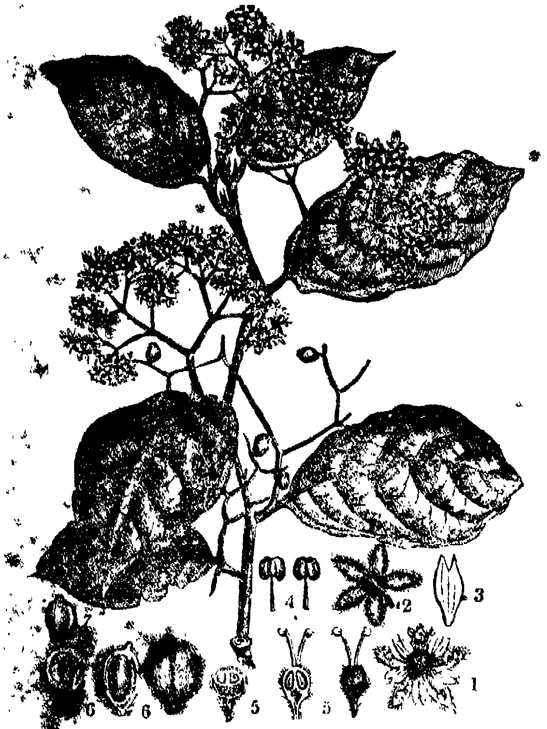
* Rennie seems to doubt this. See his [illegible] his edition of [illegible].

CHAIA. (Zoology.) [PALAMEDEIDÆ.]

CHAILLETIA'CEÆ, an obscure natural order of polypetalous exogens, some of whose species are said to be poisonous. They are very near Rhamnaceæ, from which they differ in having the stamens alternate with the petals, and five hypogynous glands. The petals are small scale-like bodies stationed at the orifice of a tubular calyx; the ovary is superior, and two or three celled, the ovules pendulous, the fruit somewhat drupaceous, and the seeds without albumen.



[Chailletia pedunculata.]

1, an [illegible] ded flower; 2, the back of ditto; 3, a petal; 4, stamens; 5, different [illegible] of the ovary; 6, different views of the fruit; 7, an embryo.

CHAILLOT, formerly a vil[illegible] n the immediate vicinity of Paris, from the main [illegible] which it is separated by the Champs Elysées: it [illegible] constituted a suburb of Paris by Louis XIV. in 1659: its church is now a chapel of ease to the parish of La Madeleine. It is built on an eminence on the right bank of the Seine, and presents, when viewed from that river, a pleasant appearance. The salubrity of the air and the agreeableness of the prospects have led to the erection of many country houses in it: the gardens of some of these slope down to the river. It had formerly several religious houses. The celebrated carpet manufactory, called the Savonnerie, is in Chaillot. There is also a machine for supplying water in cases of fire, the *Pompe à feu*. This machine, which is worked by steam, draws water from the Seine, which, after being purified in four reservoirs, is distributed to various parts of the town by a main pipe of cast iron of one (French) foot diameter. This machine was [illegible] in 1781, but has since been much improved. [illegible] a Roman aqueduct or subterranean water[illegible] been discovered at Chaillot: it conducted water to a bath situated where is now the Palais Royal. (Dulaure, *Hist. de Paris*, and *Hist. des Environs de Paris*.)

CHAIN CABLES, or iron [illegible] for vessels, are of recent introduction. The imperfection of cables made of hemp had long been acknowledged, but it [illegible] before the supply of this material had become uncer[illegible] deficient, in consequence of the last war, that any a[illegible] was made to obtain an efficient substitute. The lia[illegible] ity of the old cables to be destroyed, by chafing in rocky anchorage grounds, frequently occasioned the loss of shipping. The necessity of anchoring in such unfavourable places might occur several times in the course of a long voyage, and not only would danger be incurred on each occasion, but there was a risk of a ship being compelled, [illegible] to the loss of anchors, to pursue her course destitute of the usual means of security. The action of the water upon hemp, and its being alternately exposed to the air and water, rendered in time the strongest cables rotten and insecure. The idea of substituting iron cables first occurred to M. Bougainville, who made a voyage round the world, an account of which was published in 1771. The idea was not taken up [illegible] 1808, when Mr. Slater, a surgeon in the navy, took out a patent for a chain-cable. Its merits were not much valued until [illegible] Brown, who had made experiments with chain-cables [illegible] enabled him to form a just opinion of their advantages, published the results, and thus directed the attention of naval men to their superiority. The Admiralty soon after ordered them to be tried in the navy. In 1812 Mr. Brunton obtained a patent for further improvements; and after the war he enjoyed a *brevet* for importing chain-cables into France, but the advantages which he derived from it were so small that he relinquished his privilege.

Chain-cables are now furnished with bolts at the distance of a fathom or a couple of fathoms from each other, by withdrawing which a ship may slip her anchor in case of necessity with less trouble than was formerly required in cutting a strong hempen cable. A plan has also been contrived which prevents the anchor and cable from acquiring too great a rapidity of descent when the anchor is let go. The strength of every part of a chain-cable is fully proved by machinery before it goes out of the manufactory. The weight of the cable when the ship is at anchor is advantageous, as the strain is exerted on the cable rather than the ship, and must be excessive to draw the cable into a straight line. Instances have occurred of ships enduring a violent storm of several days' continuance, during which thirty or forty fathoms of their iron cables have been completely polished by contact with rocks and other rough materials. Under such circumstances a hempen cable would have been chafed to pieces, and the vessel inevitably lost. The use of chain-cables is now becoming universal, in the mercantile service as well as in the royal navy; and in the 'Report of a Committee of the House of Commons on Shipwrecks,' (presented August 15th, 1836,) no allusion is made to the occurrence of shipwrecks arising from defective cables; though formerly many originated from this cause. The use of chain-cables has been indi[illegible] encouraged by the circumstance that a vessel prov[illegible] with these improved means of security can be insured on more favourable terms than those which are without them.

CHAIN (in surveying) is a measuring [illegible] of 100 links, altogether 4 poles, or 66 feet, or 22 yards, i[illegible] length, so that ten square chains make an acre. It is [illegible] called Gunter's Chain, having been first used by him, and described in his treatise on the cross-staff, &c. in the following words: 'We may measure the length and breadth by chains, each chain being four perches in length, and divided into 100 links, then will the work be more easie in Arithmetic. For as 10 to the breadth in chains: so the length in chains to the [illegible] it in acres.'

[illegible] chain is of universal use [illegible] ern surveying; but care must be taken to verify its [illegible] th from time to time, since the material is very extensible, and the apparatus must necessarily be roughly used. It is stated in the account of Troughton (Ast. Soc. Monthly Notices, [illegible]), that the chains of two surveyors, who differed in their measurement, being sent to him, one was found two [illegible] too short, the other three inches too long.

CHAIN SHOT. T[illegible] balls linked together by a chain eight or ten inch[illegible] called. They are used in naval actions.

CHALA'ZA, that part in a seed where the vessels of the raphe pass from the exterior integument [illegible] and expand into the secundine. In the common almond it is readily seen by [illegible] the testa [illegible] out and observing that part which corresponds to the apex of the cotyledons. When the foramen of a seed is next the hilum, the chalaza is most conspicuous; but when the foramen is at the apex of the seed, the chalaza will then be in contact with the hilum, with which it must necessarily be then confused.

CHALCE'DON, properly CALCHE'DON, a town of Asia Minor, on the coast of the Propontis, and at the entrance of the Bosporus, nearly opposite Byzantium. It was built by a colony from Megara, 675 B.C. The earliest history of Calchedon is connected with that of the neighbouring Megarian colonies. [BYZANTIUM.] It was taken by the Persians, retaken by the Athenians, then recovered its independence, and entered into a confederation with Byzantium and other neighbouring cities. It was afterwards subject to the kings of Bithynia; and lastly, under the reign of Valens, the Calchedonians having embraced the part of the pretender Procopius, Valens, after his victory over the latter, ordered the walls of their town to be razed. In [illegible]n history Calchedon is known for its council held [illegible]51, which was attended by 630 bishops from both the east and the west. It was the fourth œcumenic or general council of the church, those of Nicæa, Constantinople, and Ephesus having preceded it, and was convoked by the Emperor Marcianus. It was the first council at which the bishop of Rome, then Leo I., called the Great, held the presidency by means of his legates. The council condemned the heresy of Eutyches on the nature of Jesus Christ. By the 28th canon of the same council, the see of Constantinople was declared to be equal in dignity, though next in place, to that of Rome, and full jurisdiction was given to it over the churches of Thrace, Asia, Pontus, and other eastern provinces. The legates of Rome opposed this canon, which however was passed by the bishops and approved by the emperor.

Calchedon is now a poor village, inhabited chiefly by Greeks, two or three miles south of Scutari, on the site of the antient Chrysopolis.

CHA'LCIDES, Daudin's name for a family of lizards, which like the seps-lizards are very long and serpent-like; but whose scales, instead of being imbricated or disposed like tiles, are rectangular, and form like those of the tail in the ordinary lizards, transverse bands which do not intrench upon each other. Some, says Cuvier, have a ridge on each side of the trunk, and the tympanum still very apparent. They approach the *Cordyli*, as the seps-lizards approach the *Scinks*, and lead by several relations to the *Sheltopusicks* and *Ophisauri*. The Chalcides have four legs, but they are little developed, and the extremities may be considered as in a degree rudimentary; for some of them cannot be said to be furnished with more than one well-formed toe on each foot, though there are traces or rudiments of more. Cuvier thus arranges the family:—

A species with five toes from the East Indies, *Lacerta Seps* of Linnæus.

A species with four toes, *Lacerta tetradactyla* of Lacépède; *Chalcis tetradactyla*. The genus *Tetradactylus* of Merrem: *Saurophis* of Fitzinger.

A section which have the tympanum concealed, and leading directly to the *Bimana* (*Chirotes*), and thence to the *Amphisbænæ*. Of these, there is

A species with five toes, forming the genus *Chalcides* of Fitzinger.

A species [illegible] Brazil, with four toes before, and five behind, *Heterodactylus imbricatus* of Spix.

A species with four toes on each foot, forming the genus *Brachypus* of Fitzinger.

A species from Guiana, with five toes before, and three behind, but reduced to small tubercles so little visible that the species has been regarded at one time as having three toes, and at another as having but one. Cuvier adds, that on the first supposition, it is the *Chalcide* of Lacépède, pl. xxxii.; the *Chamæsaura cophias* of Schneider; the genus *Chalcis* of Merrem; and the genus *Cophias* of Fitzinger: and that upon the second hypothesis, it is the *Chalcide monodactyle* of Daudin; the genus *Colobus* of Merrem: but, adds Cuvier, "these genera resolve themselves into a single species."

We give *Chalcis tetradactyla* as an example of the family.

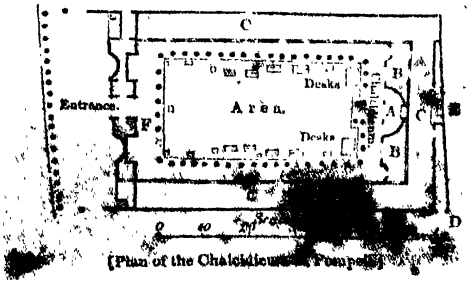
[Chalcis tetradactyla.]

CHALCI'DICUM, an apartment separated by a partition from the body of a basilica or other large building. The name, Festus says, is derived from the city Chalcis. Vitruvius (v. i.) directs that chalcidica should be constructed at the ends of a basilica, if the area is disproportionately long. [BASILICA.] A building has lately been discovered in Pompeii, which appears to be a chalcidicum from the inscription:—

Eumachia L. F. Sacerd. Publ. Nomine. Suo. Et.
M. Nu[illegible] Frontonis. Fili Chalcidicum.

Cryptam Porticum Concordiæ. Augustæ.
Pietati. Sua. Pequnia. Fecit. Eademque.
Dedicavit.

The chalcidicum is, in this instance, considered to be an inclosed space at the end of the open area of the building, in the centre of which space a large semicircular recess has been formed. The entire structure, at Pompeii, consists of a large area, about 130 feet by [illegible] surrounded by a double gallery, and has in front a pseudo-dipteral portico of eighteen columns elevated on pedestals. Under the centre of the portico was the great public entrance, which was closed with folding doors, turning in sockets of bronze, and secured by bolts. On each side of the entrance there are two large circular recesses, and beyond these again are raised platforms, the staircases to which still remain. By a reference to the plan, in *Pompeii* (p. 100, vol. i.), and to the cut below, the large area of this building will be seen, with the solid [illegible] or places for exhibiting goods, possibly cloth, for sale. The area was surrounded with a beautiful marble colonnade. Under the colonnade at the end opposite the entrance is the large recess (A), with offices (B) adjoining, which is considered to be the chalcidicum, and possibly was a commercial tribunal, or perhaps a place for ratifying mercantile contracts, &c. Behind the colonnade



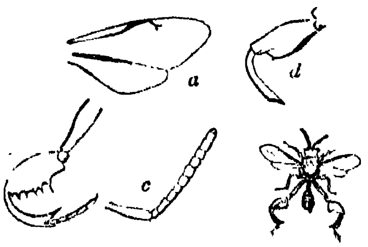
[Plan of the Chalcidicum at Pompeii.]

is a gallery [illegible] crypto porticus (C), either for winter use or a depository for goods. At the back of the chalcidicum there is a passage entrance (D) leading into the cryptoporticus; and near this entrance into the cryptoporticus is a statute of a certain [illegible]achia, erected by the *fullones* (cloth-scourers) of Pompeii to her memory. It is not improbable there was a double gallery over the colonnade and porticus, from the circumstance of a staircase at (E).

Some have taken a chalcidicum to be a spacious room, or a portico, but apparently without much reason; the word occurs on the Monumentum Ancyranum, in connexion with Curia and Templum.

CHALCI'DIDÆ, a family of Hymenopterous insects, of the section *Pupivora*, Latreille.

Nearly all the species of this group are exceedingly minute. Many of them are very brilliant, their colours consisting of various shades of green, blue, or copperlike hues; in some of the sections, however, black is the prevailing colour. The thorax is usually large in proportion to the body, and the latter is often of a compressed form, and joined to the thorax by a distinct long petiole or stalk, as in *chalcis clavipes*, which is one of the largest of the British species, measuring from tip to tip of the wings when expanded upwards of half an inch: it is of a dull black colour, and remarkable for the great development of the coxæ and femora of the hinder legs; the latter are of a reddish hue, and armed with eight little teeth beneath; the hinder tibiæ are curved. It is found on the leaves of shrubs in marshy situations.



[Chalcis clavipes.]

a, th[illegible]gs; b, the hind leg; and c, antenna—magnified d, hind-femur and tibia of a species of Donacia.

In the species just described the oviduct is short and hidden beneath the abdomen, a circumstance very common in this tribe; in some, however, the oviduct is very long, equalling or exceeding the body in length. This is the case in the genus Callimome, a group the species of which have very brilliant colours, principally green, and deposit their eggs in the larvæ of the gall insects (Cynipidæ), an operation which their long bristle-like ovipositors enable them readily to perform: here, as in the genus Chalcis, the body is compressed. Many of the species, however, have that part *depressed*. One of the most striking characters in the Chalcididæ is in the wings, which are almost destitute of nervures. Most commonly there is in the superior wing a single nervure springing from the base and running parallel with the exterior margin for about one-third of the whole length of the wing; it then slopes upwards and joins the margin itself, and a little beyond the part where the slope takes place there is a small short ramification thrown out obliquely, which is generally thickened towards the extremity, and forms a little dark spot. The antennæ are always elbowed, that is, the terminal joints are bent forward at an angle with the basal joint. We have observed that when these little insects are about to leap, which a great [illegible] of them have the power of doing, they invariably bend their antennæ under the body, and it appeared that this organ was used in making the spring; if this should be the case, it would be a most extraordinary use to make [illegible]se parts, which are usually considered either as organs [illegible] [illegible]ring or touch. We may observe that the species which we found to possess this power in a high degree had immensely thick antennæ, and the hind legs, the usual leaping organs, do not appear at all adapted for that purpose, nor can we discover any other part that is. Although in C. clavipes (the species figured) the hinder femora are thick, yet it does not possess the power of leaping; and when we examine the structure of this part, we find that it differs much from the thickened thigh of leaping insects. It is formed upon the same type as the same part in some of the Donacia tribe (among beetles), which appears to be used for clin[illegible] this species, inhabiting marshy situations, would probably require [illegible] [illegible]ing apparatus for the same reason as the Donacia do, [illegible] keep [illegible] from falling into the water. A figure of the leg of [illegible] species of Donaciæ is given, to show the resemblance both [illegible]he femur and curved tibia.

The Chalcididæ are all parasitical in their larva state; some are so minute as to undergo their metamorphosis in the eggs of other insects. The chrysalides of some of the lepidopterous insects not unfrequently form [illegible]us of an immense number of these little insects. One species of Chalcis generally confines its attack to the chrysalis of one species of lepidopterous insects; [illegible] occasionally we have reared more than one species of the chalcididæ from the same chrysalis.

Mr. Walker, a gentleman who has written much on this group of insects,* looks upon it as a great section of Hymenoptera rather than a family, and his views [illegible]ear to us correct. The Chalcididæ are divided by him into two sections, which he calls *Chalcides Pentameri* and [illegible]*alcides Tetrameri*, names applied from their having five [illegible] jointed tarsi; each of these sections is again subdivid[illegible] several families, the species of which are exceedin[illegible] merous. Mr. Westwood, who, as well as Mr. Walker, has paid great attention to this interesting group, states that there are probably 1500 species in England.

CHALCIS. [Eubœa.]

CHALCONDY'LAS, LAONI'CUS. [Byzantium, p. 81.]

CHALCONDY'LAS. [Demetrius.]

CHALDÆA. CHALDÆANS. Chaldæa is, according to Ptolemy (*Geogr.* v. 20), the designation of the south-western portion of the Babylonian empire, extending along the Euphrates, and as far as the Arabian desert. Strabo, in his account of Babylonia (xvi. c. i., t. iii., p. 437, ed. Tauchn.), speaks of a tribe (φῦλον) of Chaldæans occupying a country which borders on the Arabs and the Persian Gulf; and he evidently alludes to the same tract of land in describing the limits of Arabia (l. c., c. iv., p. 384), when he refers to 'the marshes (ἕλη) in the country of the Chaldæi, which the Euphrates forms by its inundations.' Herodotus (vii. c. 63) merely mentions the Chaldæi as ranked with the Assyrians in the army of Xerxes, without defining the country from which they came. Chaldæi also served as mercenaries in the army of Artaxerxes Mnemon. The ten thousand Greeks, in their retreat after the battle of Cunaxa (B.C. 401), had to pass their territory in the Carduchian mountains, and on the banks of the Kentrites, a tributary of the Tigris. They were armed with large (γέῤῥα) shields of wicker-work and lances; they were free (ἐλεύθεροι, Xen. Anab. iv., 3, 4; αὐτόνομοι, vii., 8, 25, *i. e.* not subject to the Persian dominion ?), and had the reputation of being valiant. Strabo probably intends to speak of these mountaineer Chaldæi of Xenophon, when he says (xii. c. 3, t. iii. p. 26, ed. Tauchnitz) that the Tiberani, the Chaldæi, the Sanni, and Lesser Armenia, are situated along the mountain-chain of Skydises, above Trapezus and Pharnakia. Gesenius (*Ersch and Gruber's Encyclopædia*, art. 'Chaldæer') and others are inclined to consider these mountaineer Chaldæi as the original stock; some descendants of which, the Casdîm of the Old Testament, settled at a remote epoch in the plains around the lower course of the Euphrates, and were for a time subject to the Assyrian empire, but subsequently founded a Chaldæo-Babylonian dominion. Whether these Chaldæi, who descended from the north, belonged to the Shemitic or to the Indo-Persian family of nations, remains doubtful. The language which was spoken at Babylon, and which is always called the Chaldæan language, is of the Shemitic stock; and the names of some Babylonian deities, mentioned by antient authors, are of Shemitic derivation. If there were sufficient reason to suppose that the worship of these deities originally belonged to a caste of priests among the mountaineer Chaldæi of the north, and that it was introduced by them into Babylonia, the name [illegible] to would strongly favour the opinion that the Chal[illegible] the Carduchian hills were Shemites. Otherwise, [illegible] geographical position of these mountaineers seems ra[illegible] to support the conjecture that they were of the Indo-Pe[illegible] race. The latter opinion is entertained by Gesenius, who supposes that the primitive name of the [illegible] *Kard*, which nerated into *Ca[illegible]* ([illegible]) and *Cald* (Chald[illegible]) [illegible] thi[illegible] it [illegible] the name of the modern Cu[illegible]

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* See the 'Entomological Magazine.'

The sources o[illegible] [illegible]ting the hist[illegible] of the Chaldæans are partly the fragments of Berosus preserved by Eusebius and Josephus, and partly the books of the Old Testament. According to Berosus, the Chaldæans traced their civilization to a being half man and half fish, which came to them from the Erythræan Sea, where it had its dwelling; a tradition which, when divested of its allegorical shape, seems to attest that the Chal[illegible]selves indebted for their first culti[illegible] came to them over the sea. Previous to the grea[illegible]. Berosus enumerates ten kings of the Chaldæans, the [illegible] of whom he calls Alôrus, and the last Xisuthros or Seisithros (Eusebii Pamphili *Chronicon Bipartitum, &c.*, ed. J. B. Aucher, Venet., 1818, 4to., p. 15), and who reigned together 120 sari, or 432,000 years. Xisuthros took refuge from the great flood in a ship, which was driven to the Cordyæan (*al.* Corcyræan) mountains. A tradition similar to that of the tower of Babel follows. Eighty-six kings and 3391 years are counted by Berosus, from the [illegible] of the great flood to the capture of Babylon by the [illegible].

According to the Old Testament, the foundation of the Chaldæan empire, in the plains of Shinear, was laid by Nimrod, the son of Cush (Gen. x. 8), *i. e.* the Ethiopian; with this may be compared the tradition of the transmarine origin of Chaldæan civilization above alluded to, and an Egyptian tradition recorded by Diodorus (i. c. 28), according to which a colony headed by Belus, the son of Poseidon and Libya, proceeded from Egypt to Babylon. The book of Genesis (xiv. 1) mentions a king of Shinear, Amraphel, who was contemporaneous with Abraham. Then follows a long blank in the history of the country; and the next occasion in which we find it mentioned is during the reign of Hezekiah, king of Judah (712 B.C.), when friendly relations are reported to have subsisted between him and Merodach-Baladan, king of Babylon (2 Kings xx. 12—18; Is. xxxix. 1). Merodach-Baladan is likewise mentioned by Berosus, who says that it was this monarch who made the state of Babylon independent of the Assyrian supremacy. He was succeeded by Belibus, a name likewise mentioned in a list of Babylonian sovereigns preserved by Ptolemæus. But three years after his accession Belibus was defeated in war by Sanherib, and Babylonia became again an Assyrian province, governed by Esarhaddon (Assaraddinus), the son of Belibus. A new epoch begins with Nabopolassar, the father of Nebuchadnezzar. Assisted by the governor of Media, Nabopolassar threw off the allegiance to Assyria (B.C. 625), destroyed Nineveh, and asserted his authority in Syria against Pharaoh Nechoh of Egypt (2 Kings xxiii. 29, 30; 2 Chron. xxxv. 20, &c.; comp. Herod. ii. c. 159). He was succeeded (B.C. 604, according to the computation of the Ptolemean canon) by his son Nebuchadnezzar, who extended his conquests as far as Egypt; Megasthenes says (Strabo, [illegible]v. c. 1., t. iii., p. 251, ed. Tauchnitz), as far as the pillars of Hercules. He undertook three expeditions against Jerusalem, the last of which terminated with the capture of that city after a siege of two years; but he was unable to take Tyrus. He died in 562 B.C., and was succeeded by his son Evilmerodach, who in the second year of his reign was slain by Neriglissar, his brother-in-law. The reign of Neriglissar lasted four years, at the expiration of which he was followed by his son Laborosoarchod, or Labassoarascus, who after nine [illegible] fell a victim to a conspiracy. Nabonitus, or Lab[illegible]ly the Belshazzar of the Old Testament, succe[illegible] This is the sovereign in whose reign Babylon [illegible] subject to the Persians. (Herod. i. c. 188.)

T[illegible] of the Chaldæans was absolute despotism [illegible] Hebrew prophets, especially Daniel and Jeremiah, men[illegible] n a considerable number of public officers. The empire was divi[illegible]nto several provinces, which were under the control of [illegible]vernors different in rank. The religion of the Chaldæans was Sabæism, and consisted especially in [illegible]ation of the sun, moon, the five planets, and the [illegible] signs of the zodiac. The worship of these heavenly luminaries led to astronomical observations, and to a regular d[illegible] of time. Herodotus attests (ii. c. 109) that the G[illegible] received from the Babylonians the division of the [illegible] twelve parts (hours). It seems that the [illegible] used [illegible] for all ordinary purposes; but [illegible]eir astronomical observations they employed a move[illegible]le solar yea[illegible]. The constitution of the latter, and its divi[illegible] of [illegible] months, appear [illegible] have been [illegible] very respect analogous [illegible] that of the Ægyptians. (Ideler, *Lehrbuch der Chronologie*, Berlin, 1831, 8vo. [illegible]35, &c.) Astrology was much [illegible]ed among the Chaldæans. The planets Bel (Jupiter) [illegible] Meni (Venus) were considered to be of good, as [illegible] (Merodach?) and [illegible]turn [illegible] of evil omen; the influence of Nebo (Mercury) depended on its position. To draw conclusions as to the future destinies of men from the position of the stars at the hour of their birth, to interpret dreams, or found predictions on the flight of birds, solar or lunar eclipses, earthquakes, and other natural occurrences, was a principal occupation of the caste of the priests, which propagated its wisdom by tradition from father to son. (Diodor. Sic. ii. c. 29.) They pretended that their astronomical observations had commenced 473,000 years before the time of Alexander. (*Idem*, c. 31.) The belief in an unalterable divine predestination was an essential part of their faith (*Idem*, c. 30); and according to Ephraim Syrus, this doctrine was still prevailing in Chaldæa during the fifth century of our æra.

The situation of the Chaldæans near the mouth of the Euphrates and Tigris was particularly favourable to commerce; and we find accordingly that they were one of the most distinguished trading nations of antiquity. They were in communication with India, partly by caravans over land, and partly by sea through the Persian Gulf. The principal articles imported from India were precious stones, dyes, pearls, wood for building ships, and cotton. Herodotus (i. c. 192) mentions that the revenue of four large villages in the plains round Babylon was appropriated to the feeding of Indian hounds, which must consequently have been imported in considerable numbers. Babylon itself was famous for superior linen, woollen, and cotton cloth, and for carpets; and Herodotus also observed that seal-rings and walking-sticks, with the handles ornamentally carved, were much in use among the Babylonians, which proves that the art of carving in stone and wood must have been generally cultivated.

(Heeren, *Ideen, &c.*, vol. i., part ii., p. 199, &c.: Winer, *Biblisches Realwörterbuch*, 2nd edit., vol. i., p. 253, &c.; Gesenius, in *Ersch und Gruber's Encyclopædie*, art. 'Chaldæer.')

CHALDRON, a measure, containing 36 bushels, heaped measure. The word appears to come from *caldarium*; in French *chaudron*, or *chaudrière*. Richelet observes that brewers, sugar-refiners, dyers, &c., make use of the *chaudrière*. Its proper signification, of a large metal vessel, or boiler, was probably transferred among us to denote a large measure of capacity.

CHALICOTHE'RIUM, a genus of fossil pachydermatous animals allied to the Tapirs, comprising two species found at Epplesheim, about 12 leagues south of Mayence, in sand, supposed to be of the second tertiary or Miocene period of Lyell. (See Kaup's *Description d'Ossemens fossiles*, Darmst., 1832.)

CHALK (in Geology), a rock which forms the higher part of a series or group termed cretaceous. [CRETACEOUS GROUP.]

Chalk is composed of nearly 44 parts of carbonic acid and 56 of lime. It is extensively used in agriculture, to improve various soils. The best land for the growth of wheat contains a certain portion of argillaceous, siliceous, and calcareous earth; and when this last is deficient, the addition of chalk improves the soil more than any quantity of animal or vegetable manure could do alone. Lime produces a greater effect by its caustic nature; but as it is always put on the land in much smaller quantities than chalk, it does not so permanently improve it. Good chalk should be firm and compact, should break readily, and crumble into a fine powder; it should readily absorb moisture, and when the lumps are exposed to frost after having been wet, they should break into minute square fragments. Chalk is called a manure, and it is in as far as everything which increases the crop may be so called; but it is a great mistake to suppose th[illegible] be substituted for animal and vegetable manures. [illegible] may so far supersede dung that where it is used a [illegible] the latter may be dispensed with; but its chief use is to improve the texture of the soil, and render it better adapted to receive and retain moisture, so that a smaller portion of dung will have a greater effect [illegible] will [illegible]o good agriculturist will [illegible] on poor [illegible] land, although he may [illegible] the soil is full of [illegible]ve matter. In this last case however lime would be [illegible]uch mo[illegible]ual; but chalk will make dung work well, and hence it is most frequently mixed into a compost with it, or [illegible]rnate heaps of dung and chalk are put upon the land an[illegible]ixed in the spreading. When chalk is used, it is of gr[illegible] importance to ascertain whether the natural soil conta[illegible] more or less of calcareous matter. The less of this matt[illegible] found in it on analysis, the greater improvement is pr[illegible]uced by chalk; hence the common saying, that 'the farther you are from a chalk-pit, the more valuable is the chalk.'

The soils most improved by it are the strong wet clays, which contain a portion of iron. Chalk acts as an absorbent, corrects astringency, and prevents, by its interposition between the particles of clay, that running into a solid mass, which is so detrimental to the roots of plants by entirely excluding atmospheric air. On loose sands its effect is different; there it acts chiefly as a cement, and the more argillaceous it is, the better it binds the siliceous particles. For light soils marl is preferable, especially when a considerable coat can be put on the land. The clay which is so abundantly used in some parts of Norfolk, and is found in many places at a small depth below the surface, owes much of its virtue to the calcareous matter which it contains, and where this is deficient, it will not much improve the soil until chalk or lime be added. Chalk is used wherever it can be procured within a moderate distance, and the soil is stiff; as in the counties of Essex, Suffolk, Berkshire, Middlesex, Buckinghamshire, and many others. In those districts where chalk is much used, it is generally put on the land in autumn, and not ploughed in till it has been exposed to the frost; or it is laid in long heaps on a headland, or by the side of a road or lane, and there turned over and mixed with the earth on which the heaps are laid. If it be exposed to the sun in summer, it must be carefully covered with earth, or it will harden so much by drying that it will be very difficult to pulverise it afterwards, and the frost will not have the same effect upon it. Ten tumbril loads of chalk, and as many of good farm-yard dung, are a very good dressing either on a fallow for wheat or previous to sowing turnips. When chalk is laid on permanent meadows, it promotes the growth of white clover; but except the meadows are wet and produce rushes, it is of no very great benefit to the grass, although it shows its effect when the grass is broken up. When land is cultivated according to the convertible system, the best time to put chalk on the land is when it is about to be ploughed up. If the grass is fed off the last year, the chalk may be put on during the preceding winter, and simply spread over the grass; it will thus be pulverised by the frost, will sweeten the pasture, and its full effect will be perceived in the first grain-crop after the land is ploughed up. When chalk has been some time in the land, it is gradually carried below the soil by the filtration of the surface-water. After a few years therefore it requires to be renewed, which shows the advantage of putting on a moderate quantity and repeating it in six or seven years, in preference to putting on a large quantity at once, unless where lands are reclaimed from a state of waste, and require to be improved by a large admixture of calcareous matter before they can be made productive by enriching manures. This is the case with those yellow loams which contain much iron, and which are generally found under the *iron pan*, so well-known to all those who improve poor light heath-land. [Barren Land.]

An important use of chalk is to form ponds in porous soils for the use of cattle. A stratum of chalk a few inches thick, protected by a coat of gravel and sand to prevent its being trod through, will effectually retain the water; and if a considerable proportion of salt is beat up with it and intimately mixed, it will effectually prevent worms from making lod[illegible]s in it, and keep in water for a very long time. It is [illegible]vantage to throw chalk into all ponds used by cattle; it corrects any acidity which may arise from stagnation, and the water in which chalk is diffused is more w[illegible] than that which contains clay alone. In fatten[illegible] chalk is of the greatest use; it may be laid in [illegible] calf-pens for them to lick, which they will readily do, or it may be scraped and mixed with a small quantity of salt, and laid in a small manger within the reach of each calf. It [illegible]ually prevents scouring, and keeps their digestion in [illegible] state.

In man[illegible] of [illegible] the whole sub-soil to a great depth is a solid mass of chalk, and the earth which covers it contains very little else than carbonate of lime, with a small [illegible]table matter in [illegible] state. In this [illegible] a short sweet herbage [illegible]ful [illegible]neep; accordingly th[illegible] downs [illegible]as-[illegible], Wiltshire, &c., [illegible]ure. [illegible]ong the sides of [illegible]e [illegible] where the waters continually accumulate the fin[illegible] particles of the soil which are washed down from above, some very productive arable lands are formed, and very good crops of barley are raised. There is a plant which seems to delight in chalky soils, and to flourish better there than in deeper and richer [illegible]. This is the saintfoin (*Hydesarum Onobrichis*), a[illegible]ntroduction among the cultivated grasses has grea[illegible] raise the value of chalky land, previously [illegible]ered too poor [illegible] repay cultivation. It not only produces [illegible]cellent fodder, superior to meadow-hay and scarcely inferior to clover, but by its roots it so divides and enriches the soil, that after having covered it with luxuriant crops of hay for several years, it leaves it in a fit state to produce excellent crops of grain, with very moderate manuring.

Chalky soils are not subject to the same perennial weeds which infest richer lands; couch-grass is seldom found in chalk, but the annuals, such as May-weed, charlock, poppy, crow-foot, and several others, abound in it. When a chalky soil produces thistles, it is an indication of its containing a portion of argillaceous earth, which improves its fertility.

CHALK STONES. [Calculus.]

CHALLENGE. [Jury.]

CHALMERS, DAVID, of Ormond, was born in the shire of Ross about the year 1530. He was bred to the church, and having taken orders at Aberdeen, where he had his early education, he proceeded abroad and studied theology and the laws in France and Italy. At Bologna he was, in 1556, the pupil of Mariannus Sozenus.

On his return to Scotland he was successively appointed parson of Suddy, provost of Croichton, and chancellor of the diocese of Ross. He was then employed in digesting the laws of Scotland, and was principally concerned in publishing the acts of parliament of that kingdom, by authority, in 1566.

On the 26th January, 1565, he was admitted an ordinary lord of session on the spiritual side, on the death of the learned Henry Sinclair, bishop of Ross, and he was also called by the queen to her privy-council. In December, 1566, he obtained a charter of the lands of Castleton, and others in the earldom of Ross, from the crown; 'hir majestie havand respect to his gud, trew, and obedient service done in all tymes past to hir majesties honour, will, and contentment, not only in this realm, bot in sik foreyn countries as it plesit hir hienes to command him, and that therethrou baith he put his persoun in perill and danger, and also ga[illegible] super expendit himsel.' It is remarkable that this [illegible] was ratified by parliament in April, 1567, which was [illegible] months after the murder of Darnley, wherein he was commonly accused of being concerned. He is said to have afterwards acknowledged his guilt by a precipitate flight to France. (Tytler's *Craig*, 95.) If so he must soon have returned again; for on the 19th August, 1568, he was forfeited for his assistance to Queen Mary, in her escape from Lochleven (*Act. Parl.* iii. 54); and on the 2nd June that year, his place of a lord of a session was given to Robert Pitcairn, commendator of Dunfermline. (*Pitmedden MS.*)

After the deposition of Mary he retired to Spain, where he was kindly received by Philip II., and after some stay in that country he went to France, where, in 1572, he presented Charles IX. his 'Histoire abrégée de tous les Roys de France, Angleterre, et Ecosse;' a work which was afterwards enlarged with a History of the Popes and Emperors, and dedicated to King Henry III. In 1573 he published his 'Discours de la Legitimé Succession des Femmes, et du Gouvernement des Princesses aux Empires et Royaumes,' which was meant as an answer to Knox's 'First Blast against the monstrous Regiment of Women.' And in 1579 he published 'La Recherche des Singularités plus remarkable concernament l'etat d'Ecosse,' which he dedicated to Queen Mary.

He soon afterwards returned to Scotland, [illegible] the 4th September, 1583, was restored by the king t[illegible] his lands, offices, and dignities. The remission was ra[illegible] by parliament on the 22nd May, 1584, but under [illegible]oviso that it should not cover 'the odious murthers of our [illegible]ane lordis dearest fader and twa regents.' (*Act. Parl.* [illegible]4.) He was never brought to trial for these [illegible] other crimes; on the 21st July, 1586, restored to his seat on the [illegible] He retained his seat [illegible] his death, which happened in t year 1592, and [illegible] 6th October, 1607, his [illegible] William Chal[illegible] to his lands of Cas[illegible] oth[illegible]

C[illegible]LME[illegible]RGE, was born at Fochabers, [illegible] Elginshire, Scot[illegible] about [illegible] of the year 1742. He received his education principally [illegible] the University of Aberdeen; studying law, he went to the British Colonies of America, where he practised at the bar until the breaking out of the revolutionary war. He then returned [illegible] Britain, and settled in London. He wrote 'Political [illegible] of the United Colonies, from their settlement till 17[illegible] and 'An Estimate of the Comparative Strength [illegible] Great Britai[illegible] works are said to have introduced [illegible] to an [illegible]exion with the Board of Trade, which he maintained [illegible] his death, May 31, 1825, aged 82 years.

He was the author of 'Caledonia,' a topographical history of North Britain; the lives of De Foe, Thomas Ruddiman, Sir John Davis, Allan Ramsay, Sir James Stuart, Gregory King, and Charles Smith, which were prefixed to editions of, or selections from, their works; and under the name of Oldys, he published a life of Thomas Paine. He also contributed occasionally to periodicals, and published a number of pamphlets, some of them anonymously.

CHALMERS, ALEXANDER, was a native of Aberdeen, where he was born March 29, 1759. His father, who was a printer, and possessed of considerable classical attainments, established the first Aberdeen newspaper. Alexander, after receiving a classical and medical education, left his native town for Portsmouth, intending to join a West India ship to which he had been appointed surgeon; but suddenly altering his intention he went to London, where he settled and maintained himself by his literary labours. He lived in intimate intercourse with most of the eminent London booksellers and printers of his time, by whom he was almost constantly employed, and for many of whom he recorded his esteem, on the occasion of their deaths, in the obituary of the Gentleman's Magazine. He died, December 10th, 1834, aged 75 years.

He contributed largely to the political and literary periodicals of the day, and edited a great variety of works. The chief are, 'The British Essayists, with Prefaces historical and biographical,' in 45 vols.; 'Shakspeare,' in 9 vols.; the 'Works of the English Poets from Chaucer to Cowper,' in 21 vols.; a 'History of the Colleges, Halls, and Public Buildings of Oxford,' and a 'General Biographical Dictionary,' in 32 vols. (*Gent. Mag.*)

CHALONER, SIR THOMAS, father and son. The elder Sir Thomas Chaloner appears to have been highly esteemed by his contemporaries as a brave, able, and worthy man. He was born in London about 1515, and educated at Cambridge. He was sent, when a young man, with Sir Henry Knevet, to Germany, and attracted attention in the court of Charles V. He accompanied Charles on his expedition to Algiers, and was shipwrecked off the coast of Barbary, and narrowly escaped drowning. On his return to England, he was employed about the court, and was knighted for his conduct at the battle of Musselburgh, in the year 1547. The fall of his patron, the duke of Somerset, affected his fortunes; but on the accession of Elizabeth, he was sent as ambassador to Ferdinand I., emperor of Germany, and was also employed in a similar capacity in Spain. He died October 7, 1565, and was buried in St. Paul's. His literary productions consist of a large collection of poetical pieces in Latin, and some prose works, one of which is 'On the right ordering of the English Commonwealth.'

Sir Thomas Chaloner, the son, who inherited a considerable portion of his father's abilities, was born in 1559. To him is at[illegible]ted the discovery of the alum mines near Whitby, in Yorkshire, the first that were worked in England. He, at all events, has the merit of having established the working of the mines. Towards the end of Elizabeth's reign, he went into Sc[illegible]nd, and rose so high in James's favour as to be afterwards appointed the guardian or governor of Prince Henry, with the control both of his education [illegible]ehold, an office which he seems to have creditably [illegible]rged. He died November 17, 1615. His only literary [illegible]uction is 'A short Discourse of the most rare and exce[illegible]t virtue of Nitre.'

One of his [illegible], Edward, entered into holy orders, and became principal of St. Alban's Hall, Oxford. He pub- [illegible] a Treatise on 'the Authority, [illegible] of the Church.' Two others, [illegible] James, were members of the Long Parliament, [illegible] sat as judges on the trial of Cha[illegible] James Chaloner is the author of a Description of the Isle of [illegible]an, printed in the original edition of King's '[illegible] Royal,' though the work has been also attributed to [illegible] James Chaloner, a native of Chester. Thomas Chaloner was the author of [illegible]al political pamphlets, [illegible] ap[illegible]d during the civil wars. (*Biog. Brit.*; Chalmers's *Biog. Dict.*; Ormerod's *Cheshire*; *Gent. Mag.*)

CHALONNE. [MAINE ET LOIRE.]

CHALONS-SUR-MARNE, on the right or N.E. bank of the river Marne, from which it is named, is the capital of the department of Marne: it is about 91 miles in a straight line E. or E. by N. of Paris, or 102 miles by the main road through Meaux, Château Thierry and Epernay: there is a somewhat shorter road by Montmirail. It is in 48° 58′ N. lat., and 4° 21′ E. long.

This town existed during the Roman dominion in Gaul, and is mentioned in the Itinerary of Antoninus under the name of *Durocatalauni*, and by Eutropius under that of *Catalauni*: the prefix *Duro*, from a Celtic word denoting water, indicates its position on the bank of a river. Near this town, A.D. 271, Aurelian defeated the army of Tetricus. [AURELIAN.] In a subsequent age it was marked by another memorable conflict. In the year 451, Attila, at the head of the Huns, who had invaded Gaul, was defeated by the combined forces of the Romans [illegible] Visigoths under Ætius and Theodoric. [ATTILA.] D'Anville conjectures that the antient name of the town was originally in the singular form Duro-Catalaunum. The plural form would be an indication that this town, like many others in France, took the name of the tribe of which it was the capital; but we are not aware that any antient writer has mentioned such a tribe. Possibly they were a subordinate clan of the Remi whom Cæsar places in this part.

The town stands in the midst of meadows through which the Marne winds. On the east side of the town on the Strasbourg road is a fine promenade called the *Jard*: the planted avenues are magnificent. The town is surrounded by a wall and a ditch. The streets are tolerably regular, and from their neatness give to the town a good appearance, though the houses are for the most part built of wood. The cathedral is chiefly remarkable for its two pyramidal stone towers, which have been by some much admired; the Grecian portico is however by no means in keeping with the rest of the building: the hôtel de ville or town-hall has a handsome façade, adorned with four columns; the hôtel or office of the prefecture is distinguished by the simplicity of its architecture.

Châlons had, in 1832, a population of 12,413. It is a town of considerable trade, being on the road from Paris to Strasbourg and the eastern departments, at the point where it is crossed by the road from Reims to the department of Haute Marne; and on the bank of a navigable river. It is the seat of a considerable commerce in various articles of agricultural produce or manufacture, which are carried down the Marne to Paris. A considerable number of casks are made here, and sent to other places in the department. A great part of the wool grown in the department is brou[illegible] to market at Châlons, and sent from there to Reims, Sedan, Metz, Nancy, and other manufacturing towns: [illegible] expressed from grain is sent to Paris, Reims and Lyon. Leather, cutlery, and some woven fabrics are manufactured.

Among the literary and scientific institutions are a high-school; a botanic garden, with which is connected a course of instruction in botany, given gratuitously; a museum of natural history; a public library of 20,000 volumes; and two seminaries for the instruction of the priesthood. But the most important establishment is the *Ecole des Arts et Métiers*, or School of Arts and Trades, at which the [illegible] government and several of the departments maintain [illegible] or in part a number of boarders: those supported by [illegible]vernment are stated by M. Balbi to amount to *450*. There is also a flourishing society of agriculture, commerce, [illegible] and arts. Among the eminent natives of this town [illegible] mentioned the astronomer Lacaille.

Châlons is the seat of a bishopric which includes t[illegible] department of Marne, except the arrondissement of Reims and has a population of 216,396. The bishop is a suffrag[illegible] of the Archbishop of Reims. The diocese was establi[illegible] in the fourth century. Châlons is [illegible] cap[illegible] of [illegible] second military division, compre[illegible] departments Me[illegible] Marne and Ardennes.

[illegible]dissement of Châlons contained in 183[illegible] a population of 4[illegible] (D'Anvill[illegible] [illegible]alte Brun; Balbi; Expilly; Reichard's [illegible] *Book.*)

CHALONS-SUR-S[illegible]E is the capital of an arrondissement [illegible] the department of Saône et L[illegible] is the most po[illegible]us place in that department. It is about 185 miles in [illegible]aight line S.E. or S.E. by S. from Paris, or 208 mil[illegible] the road through Melun, Sens, Auxerre and Autun. [illegible] is in 46° 46′ N. lat., and 4° 52′ E. long.

This ci[illegible] belonged to the Ædui at a period anterior to the Roman conquest of Gaul. In the great revolt under Vercingetorix, many Romans who were here were obliged to quit the place, and many were slain in the assaults which they had to sustain after their departure from the insurgent populace. (Cæs. *de Bel. Gal.* vii. 42). The name it bore was *Cabillonum* according to Cæsar; other modes of writing it were *Cabilonum* and *Cabilonnum.* Strabo has Καβυλλινον, and Ptolemy Καβαλλινον. Ammianus Marcellinus, who wrote about the period of the downfall of the Roman empire, mentions it as one of the ornaments of the province (*Gallia Lugdunensis Prima*) to which it belonged, and gives to its name the form *Cabillones.* From the singular form of the antient name, it was usual for a long time to write the modern name without an *s*, *Châlon*, by which, when D'Anville wrote, it was distinguished from the town described above. It is now however usually written Châlons. In the middle ages the town was much smaller than at present; but a new wall having been built, the suburbs of St. André, St. Marie, and St. Jean de Maisel were included. There is one suburb (of St. Laurent) situated on an island of the [illegible]: this is united with the town, which is on the right [illegible], by a stone bridge. This suburb contains an hospital remarkable for its internal arrangements and the excellent state in which it is kept.

The town is situated in a fertile country, surrounded by meadows, forests, and vineyards. It is well built; and from the quay there is a fine view. The public walk along the Canal du Centre is adorned with a large obelisk. There are two other public walks, one in the Island of St. Laurent, behind the hospital, the other extending along the river.

Châlons had, in 1832, a population of 12,220. It has been since the revolution a place of considerable trade, for which its situation on the banks of the Saône, close to where the Canal du Centre (which unites the Loire and the Saône) enters that river, and on the high road from Paris to Lyon and the south of France, admirably qualifies it. Among its manufactures are silk stockings, hats, hosiery, and *essence d'Orient*, a preparation of the scales of the bleak, used in the making of mock pearls. The inhabitants trade in corn, wine, leather, oil and soap; this town has a *collège* or high school, a library, an agricultural society and a theatre.

Châlons was formerly the seat of a bishopric and the capital of a district called from it Le Châlonnois. The arrondissement of Châlons had, in 1832, a population of 120,461.

CHALOSSE, a district of Gascogne, watered by the rivers Adour, Midouze, Gabas, and Luy. It is a sandy district, yet producing grain, wine, and fruits, and affording considerable pasturage to cattle. Chalosse was bounded on the N. by the Bazadois, on the S. by Béarn, on the E. by Armagnac, and on the W. by the Pays des Landes. It was subdivided into the territory of Marsan and Chalosse Proper, of which St. Sever was the capital; the territory of Marsan was the smaller of the two, but more productive for its extent. This division of Gascogne is not noticed in the map of 'France in Provinces,' published by the Society for the Diffusion of Useful Knowledge, though the subordinate district of Marsan is. In some old maps the territory of Chalosse Proper is called Gascogne, as though that name were in strict propriety limited to this district; to Marsan they gi[illegible]e name of Albret.

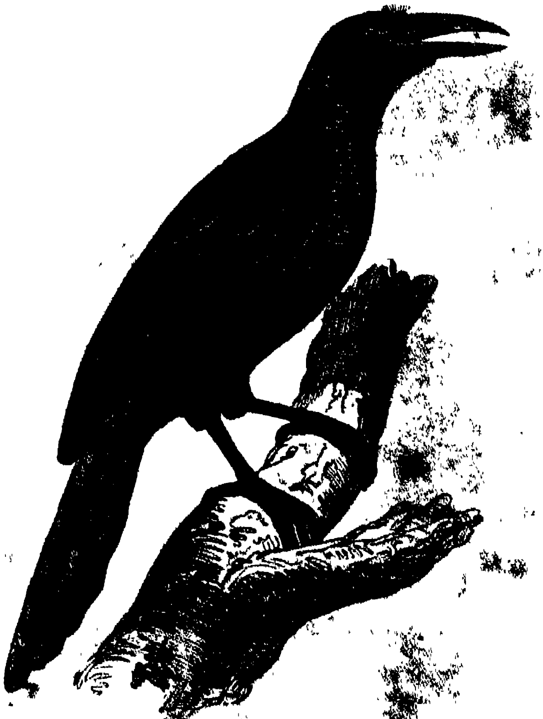
CHALUS, a small town in France on the river Tardoire and on the road between Limoges and Perigueux. Its population (given by the 'Dict. Universel de la France,' Pa[illegible]4, our latest authority, at 1356) would be too small to [illegible] it to a separate notice, but for the historical interest attached to it.

[illegible] Guidomar, Viscount of Limoges, had refused to deliver to Richard Cœur de Lion, king of England and feudal lord of several of the finest provinces of France, a treasure which he had found. Richard consequently attacked the viscount, and laid siege to the castle of Chaluz, which belonged to him. He refused to the garrison, who offered to surrender, an [illegible] that their lives should be saved; and while reconnoitring the castle, in order [illegible] the poi t of attack, he was wounded in the [illegible] arrow by Bertrand de Gourdon, one [illegible] lingering about ten days, [illegible]ken before his death, and the gar[illegible] except [illegible] of Bertrand who was res[illegible]d [illegible] more dreadful fate. The bold demeanour of this man, who, when brought before the dying monarch, avowed and gloried [illegible] excited the admiration of Richard, who pardoned him. He was, however, put to death, after Richard, expir[illegible]her by Marchadès, commander of the Brabançons, or [illegible]aries in the service of Richard, or by Philippe Au[illegible]ing of France. (Sismondi, *Hist. des Fr*[illegible]

CHALYBÆUS (Zoology), a gen[illegible] birds separated by Cuvier from the *Cassicans* of Buffon, [illegible] of Cuvier. The bill has the same form as th[illegible] of the Cassicans, but it is a little larger at the base than that organ is in the last-named genus, and the nostrils are pierced in a large, membranous space.

Geographical distribution.—The known species come from New Guinea, and are remarkable for the metallic tints of their plumage.

Example. *Chalybæus paradisæus.* This richly-plumed bird is the *Paradisea viridis* of Gmelin; *Le Calybé de la Nouvelle Guinée* of Buffon; *Le grand Chalybé* of [illegible] Vaillant; *Oiseau de Paradis vert* of Sonnerat; *Par[illegible] chalybea*, Blue-green paradise bird of Latham; *Cracticus chalybeus* of Vieillot; *Barita viridis* of the first edition of the Règno Animal (where it was placed under the Cassicans, *Barita*), and *Chalybæus paradisæus* of the last edition. It is the *Mansinème* of the Papuan tongue, according to Lesson, who thus writes on the subject from personal observation. 'Among the numerous skins of birds of paradise which the inhabitants of New Gui[illegible]brought daily on board, I found some *Chalybæi* depri[illegible] of their feet, and run through with a stick like the skins of the true birds of paradise. Afterwards we often procured in our shooting parties a bird which does not vary from that of which we speak, except in having a more sombre and tarnished plumage, there being no difference in the proportions of the body, bill, wings or tail. We regard it as a slight variety of the *Calybé* of authors; for those that we saw, which were adult and in complete plumage, did not permit us to think that they could be *Chalybæi* before or after their moult. The total length of our *Chalybæus* was fourteen inches six lines (French). The bill [illegible] not at all from the ordinary *Cha*[illegible]*s*. The head is large, and the tail, six inches in length, is rounded by the [illegible]position of the feathers, as in the preceding. The plumage [illegible]ly



[Chalybæus paradisæus.]

bluish metallic [illegible] ne of the ir[illegible] and violet ti[illegible] are [illegible] (es) and [illegible] on [illegible] f burnished steel it were [illegible] rus, but the plumage th[illegible] a uniform tint, having the brilli[illegible] lar iron (*fer spéculaire*) following the reflections [illegible]. The feathers which cover the head and neck are short, close set and velvety. The nostrils are partially closed by a membrane covered by the frontal feathers, which advance on each side of the edge (*arête*) of the bill, which is black. The iris is coral-red, and the legs are of the same [illegible] the bill. Their shanks (*tarses*) are covered with [illegible] scales (*écussons*), and their toes are strong, furnished [illegible] ressed claws, flattened above, and crooked.

'The *Chalybæus* lives solitary in the forests of New Guinea. We often saw it perched in the great trees, where it seeks for fruits. Its manners appeared to have great analogy to those of the crows.'

CHALYBEATE SPRINGS. Of all mineral waters, those containing iron are the most common; but such only are considered chalybeates, in a medical sense, in which the iron predominates, if not in quantity, at least in action, over the other ingredients. The quantity and combinations of the iron vary in every spring; but it is generally combined with carbonic acid, in the form of protoxide or protocarbonate, and is deposited in considerable quantity in the form of oxide, when the water reaches the external air. The presence of chalybeate springs may generally be detected by the appearance of the stream or water-course. The inky or styptic taste of the water also indicates the presence of iron. In other instances it is combined with sulphuric acid, in the form of sulphate of iron: it is often associated with alumina; and more rarely hydrochloric acid is combined with it. When a large proportion of free carbonic acid is present, such springs are termed *acidulo-chalybeate*.

The temperature rarely exceeds that of the ordinary temperature of spring water, and it is generally lower. Of the former class several exist on the Continent: Bath is the only example in Britain. Cold chalybeate waters, with proper conveniences for their employment, are not very numerous in Britain. Tunbridge, Harrowgate, and Holywell, in England and Wales; and Hartfell, Peterhead, Dunblane, and Bonnington, near Edinburgh, are the chief. Chalybeate waters may be employed either internally or externally in the form of baths; the former mode is the most common in this country. The use of chalybeate waters possesses many advantages over the other modes of administering iron, and not only enables many to employ the metal, but likewise to persevere with it for a much longer time. This is more particularly the case when much free carbonic acid exists in the water, as in the acidulo-chalybeate springs. The cold temperature of the water certainly disagrees with many persons, but this may be obviated, either by beginning with the Bath waters, or pouring the quantity intended to be used into a little warm water, or adding a tea-spoonful of the compound tincture of cardamoms to the first glass. The persons who require chalybeate waters are those who need tonics to improve their constitution and remove a tendency to disease; or convalescents from acute diseases; or persons who have been debilitated either by a residence in warm climates or by severe mental exertions. Persons of a plethoric habit can rarely use them without undergoing some preparatory treatment. Like iron, they are improper during pregnancy, or the course of any inflammatory disease, or the existence of organic affections of the heart or liver, or tendency to apoplexy. When alone, or still more when combined with alumina, they often cause constipation, which requires to be obviated; in some individuals, especially at the commencement of their use, the opposite state occurs: in either case a black colour of the motions is observed, which should excite no alarm, as it simply arises from the tannin of the food uniting with the iron, and forming a black tannate of iron. During the use of chalybeate waters, the diet of the patient requires careful regulation.

The acidulous and carbonated chalybeate waters do not bear transportation well; the waters which contain sulphate of iron may be sent to a distance with less injury to their qualities. Two methods have been proposed to prevent the deterioration of the acidulous and chalybeate waters during removal to a distance: the one by boiling the corks previous to putting them into the bottles; [illegible] by merely driving an iron nail through the cork so as [illegible] in contact with the water, which latter method is even said to increase the quantity of iron held in solution by the water.

Baths of chalybeate water are sometimes used along with the internal employment of the waters, sometimes alone. They afford great assistance in the cure of diseases for which iron is proper, and can sometimes be employed when the internal use of iron is impracticable. Those of this country are less resorted to than Alexisbad in the Harz, or those of Nassau. See *Bubbles from the Brunnen of Nassau.* [Iron. Bathing.] Gairdner *on Mineral and Thermal Springs.*

CHAMA. [Chamacea.]

CHAMA'CEA or CHA'MIDÆ, a family of conchiferous mollusks, the third of the acephalous or headless testacea, according to Cuvier, who places them between his *Mytilacea* (mussel-like testaceans), and his *Cardiacea* (cockle-like testaceans).

Under the Linnæan genus *Chama*, many heterogeneous forms were assembled; and as G. Sowerby observes, 'in his arrangement regular and equivalve shells are placed with such as are irregular and equivalve; free shells with others that are attached to marine bodies; and shells which have two distinct muscular impressions with others which have only one.

* Bruguière first divided this genus, and Lamarck carried out the reformation. The latter makes the *Chamidæ* to consist of the genera *Diceras*, *Chama* and *Etheria*, placing *Tridacna* and *Hippopus* under his *Tridacnées*, the first section of his second order *Conchifères monomyaires*.

Cuvier made the *Camacées* consist of the genera *Chama*, *Tridacna*, *Hippopus*, *Chama*, (Brug.) *Diceras*, and *Isocardia*.

De Blainville arranged under the family *Chama*, *Diceras*, *Etheria*, *Tridacna* (including *Hippopus*), *Isocardia*, or as he writes it *Isocardium*, and *Trigonia*; giving, however, his opinion that *Etheria* is more properly placed under the family of *Margaritacea*, than under the *Chamacea*; and observing that, according to what M. Deshayes had told him concerning the pallial impression indicating the disposition of the lobes of the mantle, there could be no longer any doubt of this.

Rang, in his 'Tableau Méthodique,' arranges the following genera under the *Camacés*: *Etheria*, *Chama*, *Diceras*, *Caprina*,—a genus which he conceives to have been confounded with *Diceras*,—*Isocardia*, *Tridacna*, and *Hippopus*.

Deshayes, in his Note to his edition of Lamarck, observes, that many observations may be made upon this family, composed, according to Lamarck, of three genera. He says, 'we think it ought to undergo some sufficiently important modifications. Thus in comparing the young *Dicerata* with the *Chamæ*, there is no difference worthy of note; but it must be added, that in proportion as the shells of *Diceras* increase in age, the characters of the hinge become more and more exaggerated, without such an alteration as renders them entirely dissimilar to what they were in their youth. It may be said then, in reality, that the *Dicerata* are only *Chamæ* exaggerated in their volume, their thickness, the prominence of their *umbones* (*crochets*), and the size of their cardinal teeth. There would not then be any inconvenience in uniting the two genera, forming for each of them a section which would have thus less value than a genus established for each.' With regard to *Etheria*, we quite agree with M. Deshayes (who quotes M. Rang's description of the soft parts in the 'Annales du Muséum,' as confirming his (Deshayes's) previous views) in coming to the conclusion that it is necessary to separate the *Etheriæ* from the *Chamacea* or *Chamidæ*, which will then consist only of the genera *Chama* and *Diceras*, if, indeed, the [illegible]tor should be considered as having the rank of a genus.

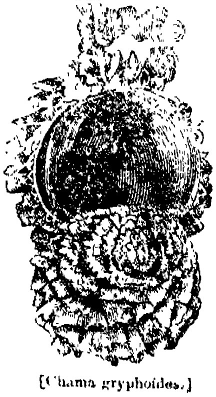
Genera.

Chama. The valves are irregular, inclining for th[illegible] part to the orbicular shape, unequal, generally fo[illegible] spined externally, and adherent. The umbones are distant, unequal, and curled or involute. The hinge consists of one thick, oblique, somewhat notched tooth, inserted into the groove of the opposite valve. There are two muscular impressions, and they are distant and lateral. The ligament is external, and divided into two portions at its [illegible]erior ex-

For the soft parts Poli should be consulted. The

(*Psilopus* of Poli) is less irregular than the shell, and cordiform or heart-shaped; the two lobes of the mantle unite posteriorly, and in the commissure are two very s[illegible] ciliated siphons, like those of *Isocardia*. Upon the abdominal mass a small cylindrical truncated bent foot rises. The mouth is small, and is furnished on each side with a pair of somewhat square and obliquely truncated palpi. Deshayes states that all the individuals of the same species adhere by the valve of the same side, and that the umbones curve in the same direction.

Broderip, in the 1st vol. of the 'Transactions of the Zoological Society of London,' p. 301, (1834) where he describes several new species brought home by Mr. Cuming, says, 'the shells are attached by their external surface to submarine bodies, such as corals, rocks, and shells, and have been observed at depths ranging from points near the surface to seventeen fathoms. These shells appear to be subject to every change of shape, and often of colour, that the accidents of their position may bring upon them. Their shape is usually determined by the body to which they are fixed; the development of the foliated laminæ which form their general characteristic is affected by their situation; and their colour most probably by the food, and by their greater or less exposure to light. The *Chama* that has lived in deep and placid water will generally be found with its foliations in the highest state of luxuriancy; while those of the individual that has borne the buffeting of a comparatively shallow and turbulent sea, will be poor and stunted. Lamarck has divided the species into two sections: *viz.*, first, [illegible] the umbones of whose shells turn from left to right; secondly, those whose umbones turn from right to left. [illegible] Sander Rang in his Manual, has adopted this division,* to which I cannot subscribe, because it will not bear the test of examination. Two remarkable instances are now well known of regular bivalves of the same species, in which one specimen may be regarded as being the reverse of the other, viz. *Lucina Childreni*, and an inequivalve *Mytilus* in the British Museum: and to come at once to the case before us, the same species of *Chama* is sometimes attached by the right, sometimes by the left valve; or, in other words, in one individual of the species the umbones will turn from left to right, while in another individual they will turn from right to left.' The same author observes, that the distinction of the species appears to him to be difficult, the variety being infinite. The number of recent species given in Deshayes's edition of Lamarck (1835) is seventeen, including *Chama albida* (*Camostrée* of De Roissy; *Cleidothærus* of Stutchbury). Broderip, in the paper above alluded to, describes eleven additional species with varieties not noticed by Deshayes, who has however some observations on the following species, *Chama Lazarus, gryphoïdes, unicornis, asperella*, (the living analogue of *Ch. echinulata* in Lamarck's fossil list,) and *albida*, well worthy the attention of the student. We select as an example *Chama gryphoïdes*.



[Chama gryphoides.]

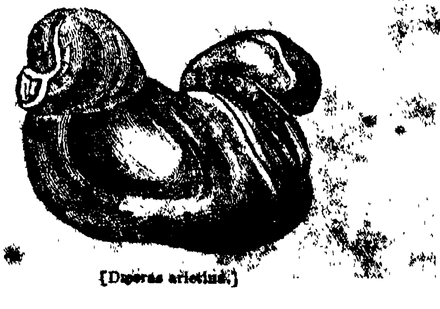
[illegible]*hical distribution.* Apparently confined to the [illegible]as, the Mediterranean being the locality of the [illegible]west temperature where any of the species have been hitherto found.

Fossil Chamidæ.

We have already seen the approximation, not to say identity, between *Chama* and *Diceras*. [illegible] may however be as [illegible] in [illegible]ent [illegible] to keep the two distinct.

Chama. [illegible] and occur in the supracretaceous [illegible] subapennine beds, and those of [illegible] the cretaceous group; and also in th[illegible]. B. Sowerby they are found in the [illegible] and *Calcaire grossier*, also in the chalk and gr[illegible] Deshayes, in his tables (vol. iii. of Lyell, 1833), g[illegible]iving species and twenty fossil (tertiary), occurring in the [illegible] Miocene, and Eocene periods. Of these [illegible] viz. *Ch. gryphoïdes, crenulata, sinistrorsa* [illegible] both living and fossil, the localities [illegible] exception of *crenulata*, from [illegible]ranean sea. The species found in more than one tertiary formation he makes *Ch. echinulata, rustica*, and *lamellosa*, and gives the following number of species in the localities here mentioned:—Four in Sicily, four in Italy (subapennine beds), one at Bordeaux, three at Dax, three in Touraine, two at Vienna, two at Angers, nine at Paris, one at London, and two at Valognes. In the fossil list of his edition of Lamarck (1835), Deshayes enumerates only thirteen fossil species, and of these he makes *Chama gryphina* include *Chama sinistrorsa* as a synonym, observing [illegible] note that he knows the living analogue as existing [illegible] Sicilian seas, and that the species No. 3 (*Chama lacernata*) is a variety of this, while the valves cited as belonging to the environs of Angers belong to another species. *Ch. echinulata* he identifies with *Ch. asperella* now living in the Mediterranean. *Ch. unicornaria*, he observes, was formed for a variety of *Ch. gryphina*, with very large *umbones*, and he suggests the necessity of uniting *Ch. gryphina, lacernata*, and *unicornaria* in one species. Nilsson names *Ch. cornu Arietis*, (*Diceras arietina?*) Kjuge; Morby, Sweden; and *Ch. laciniata*, Kjuge; Balsberg; Morby, Sweden; and Mantell, an undetermined species from the chalk, Sussex. Phillips names *Chama mima*, or *Gryphæa mima* (the genera are sufficiently different, by the way), from the coral oolite and calc. grits of Yorkshire. Smith, *Chama? crassa* from the Bradford clay. Thurman, *Ch. Bernojurensis* from the calc. grit, Bernese Jura; and Lonsdale, an undetermined species from the forest marble, cornbrash, and Bradford clay, Wilts. None of these appear to be noticed by Deshayes in his last edition of Lamarck.

Diceras.—In addition to the supposed identity of *Diceras* with *Chama*, already alluded to, Cuvier says that the *Dicerata* do not appear to differ from the *Chama* in any thing essential; only their cardinal tooth is very thick, and the spirals (*umbones*) of their valves are sufficiently projecting to remind the observer of two horns. G. B. Sowerby writes: 'On account of the similarity between this genus (*Chama*) and *Diceras* we shall be expected to explain the characters by which this latter is distinguished from *Chama*, with which indeed it is arranged by Bruguière; these, according to Lamarck, are the large, conical, diverging, spiral *umbones*, and the large, concave, subauriculate, prominent tooth in the large valve of *Diceras*. Not having ourselves seen the hinge of Diceras, we will not venture to offer an opinion; but, judging from the specimens we possess, we see in Diceras a sort of connecting link [illegible]een Isocardia and Chama, having both the *umbo*[illegible] and involute, and being, moreover, a nearly eq[illegible] shell, like Isocardia: but being attached by one valve, and not *quite* equivalve; in these respects resembling Chama.' Rang observes: 'This genus is very imperfectly known without doubt, but nevertheless one may well believe that it is very near to *Chama*.' Defrance enumerates five species. Deshayes does not give it as a genus in his tables, and in his last edition of Lamarck only two species are recorded,



[Diceras arietina.]

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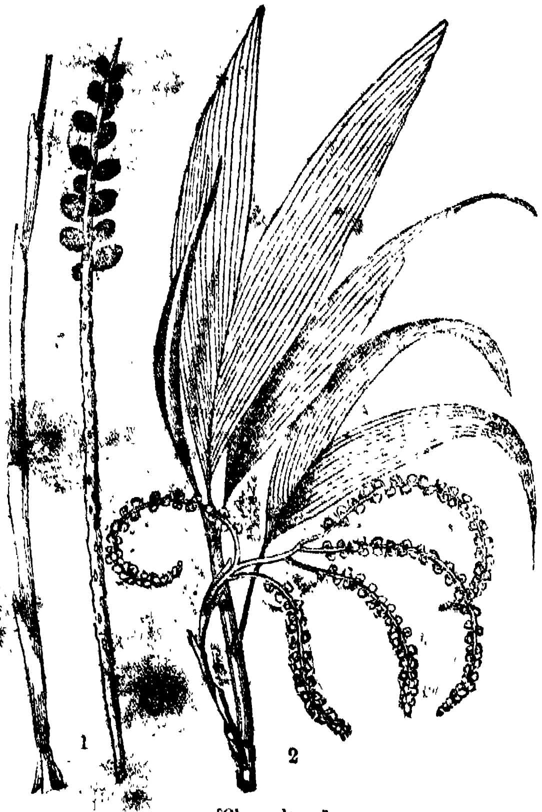
* And so has De Blainville

Diceras arietina (Lam.), the type from Mont Salève and the neighbourhood [illegible] and [illegible]ras [illegible] (Desh.) from the [illegible] vicinity of the last named place.

Rang would place [illegible] the *genus Caprina* of D'Orbigny *père*; [illegible] that if that zoologist would publish his [illegible]eries on these interesting shells, the genus would be [illegible]lly adopted. The genus *Ichthyosarcolite*, which has [illegible] always classed with the cephalopods, might, he thinks, belong to a bivalve approximating *Caprina*. Deshayes, he says, communicated to him the same idea. But the [illegible] author does not notice the genus when treating of D[illegible] in the last edition of Lamarck.

CHAMÆDO'R[illegible], a genus of palms, also called Nunnezharia and Nunnezia. They are small reed-like plants, with ringed shoots. Their leaves are either cleft or pinnated. The inflorescence is sessile within the sheaths of the leaves, and branched in an irregular manner; the spathes are membranous. The flowers are yellow and dioecious, without bracts, which is a remarkable circumstance. In the males the calyx is cup-shaped and three-parted; the petals three, and the stamens six. In the females the calyx and petals are the same; the ovary three-celled; the berry one-seeded; the albumen even; and the embryo lateral. These [illegible] palms of humble growth, receding in that respect from the general character of the order, and approximating to herbaceous Endogens, or to Bamboos. *Ch. fragrans*, the Chutasslium of the Peruvians, is a plant with a stem about a man's height, and so fragrant as to fill the groves with its perfume in the months of August, September, and October.



[Chamædorea.]
1, C. pauciflora; 2, C. fragrans.

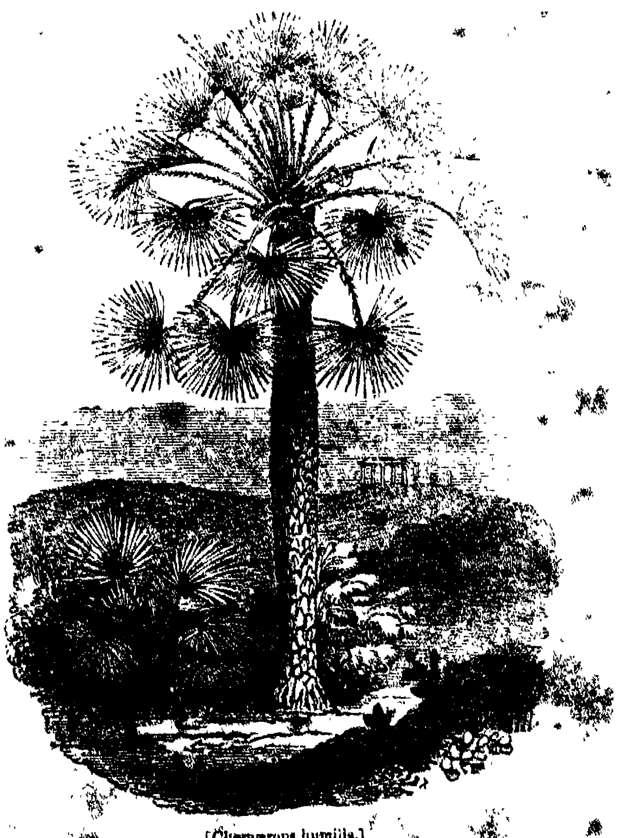
CHAMÆLE'DON PROCUMBENS, a beautiful little alpine bush, formerly referred to Azalea, from which it differs essentially both in habit and botanical characters. It is a small evergreen creeping shrub, found on the mountains of Europe and North America. The leaves are leathery, shining, turned back at their edge, and about half an inch long. The flowers are minute, and grow in terminal umbels of a light flesh colour. The calyx is five-parted; the corolla campanulate and regularly five-cleft, the anthers rounded and opening longitudinally. It is occasionally seen in gardens, but it is rather impatient of cultivation.

CHAMÆLEON, a [illegible]llation near the [illegible]th Pole, formed by Bayer. [BAY[illegible]] The stars are as [illegible]ows:—

Character.	No. in Catalogue of		Magnitude.
	Lacaille.	Astron. Society.	
α	770	1036	5
θ	774	1043	5
η	817	1091	5
	822	1096	5
γ	95[illegible]	1268	5
δ²	978	1290	5
ε	10[illegible]	1384	5
β	1071	1411	5

CHAMÆPE'LIA. [DOVES.]

CHAMÆ'ROPS, a genus of palm trees, in which is comprehended the most northern species of those remarkable vegetable productions whose home is so frequently in the tropics. It is characterized by its flabelliform leaves, polygamous flowers, which are sometimes even dioecious, and triple monospermous drupes, with ruminated albumen. *Chamærops humilis*, the European species, grows in hot-houses to the height of fifteen feet: but in Spain and Barbary it is not more than four or five feet high, and in Italy it is much dwarfer. It is common upon the hills near Algiers; it occurs in many places in the southern parts of Italy; and reaches its northern limits in the [illegible]y of Nice. The trunk of this plant is five or six in[illegible] diameter, and closely covered with triangular hard s[illegible]s, which are the bases of the antient leaves. The new leaves grow in a tuft at the top of the stem, and have smooth flat stalks, with rigid spines proceeding from the edge; the blade is deeply palmate, with from twelve to fifteen narrow sword-shaped divisions, which are slightly glaucous and downy. The flowers grow within compressed spathes, which are downy at the edge, and from six to eight inches long, and [illegible] compressed spadix, which is closely covered [illegible] The [illegible]upes are blackish-brown, and round, with a [illegible]s dr[illegible] [illegible]ongy flesh. The young underground parts of [illegible] the young roots, are said by Desfontaines to



[Chamærops humilis.]

CHAMÆSAURA. [CHALCIDES. CHIROTES. SEPS.]

CHAMÆZA (Zoology), a genus of the family *Merulidæ*, Vigors. [MERULIDÆ.]

CHAMBER, a recess formed at the lower extremi[illegible] the bore of a gun, howitzer, or mortar, and in the dire[illegible] of the axis, in order to receive the charge of powder by which the shot or shell is to be projected. It is made of a cylindrical, hemispherical, or parabolical form, and its magnitude is such as to allow it to contain the quantity of powder constituting the charge, but its diameter is less than that of the bore, in order that the fired gunpowder may act more intensely upon the projectile in the line of its direction.

The Gomer chamber, so called from the name of the inventor, is made in the form of a frustum of a cone, terminating with a concave hemisphere at the smaller part, which is the extremity of the chamber, and the greater circumference coinciding with that of the bore. The shot or shell, being placed in close contact with the conical part of a chamber of this kind, thus becomes subject to the whole force of the elastic fluid.

From some recent experiments, it appears that the parabolic chamber is preferable to the other kinds; and if we suppose that the inflammation of the powder were to commence at the focus, the superiority of effect might be conceived to be owing to that property of this curve by which the rays from the focus, after striking the surface, are reflected in lines parallel to the axis.

CHAMBER, IMPERIAL. [IMPERIAL CHAMBER.]

CHAMBERLAIN, *custos cubiculi*, or *cubicularius*, keeper of the chamber, was an officer of great antiquity, and occurs among many of the earliest nations. In those of the East, as appears from the description of persons employed, chamberlain and eunuch were often synonymous. In the Anglo-Saxon times, in England, the chamberlain appears to have had the name of Camerarius, and had the keeping of the king's treasure (Ealred, *in vit. S. Edw. Confess.*, c. ii. p. 9), by which name this officer also occurs in the Domesday Survey.

The office of lord great chamberlain of England was once of the highest dignity, and was held in grand serjeanty from the second year of King Henry I. by the family of De Vere, from whom it passed, by a female heir, to the family of Bertie. By the statute of precedency, 31 Hen. VIII., the great chamberlain's place was next to that of the lord privy seal. In 17[illegible], the Marquess of Lindsay, then hereditary great chamberlain of England, having been raised to the dukedom of Ancaster, surrendered this precedency for himself and his heirs, except only when he or they should be in the actual execution of the duties of the said office, in attending the person of the king or queen, or introducing a peer into the House of Lords. This surrender was confirmed by Stat. 1, Geo. I. c. 3. The duties which now devolve upon the great chamberlain are, the dressing and attending on the king at his coronation; the care of the antient Palace of Westminster; the provision of furniture for the Houses of Parliament, and for Westminster Hall, when used on great occasions, and attendance upon peers at their creation, and upon [illegible]hops when they perform their homage. On the death of Robert, the last duke of Ancaster but one, in 1779, the office of hereditary great chamberlain descended to his two sisters, Priscilla Lady Willoughby de Eresby, and Georgiana Charlotte Marchioness Cholmondeley, by whom Sir Peter Burrell, the husband of Lady Willoughby (afterwards Lord Gwydir), was first appointed to perform the duties; and subsequently, in 1821, his son the present Lord Gwydir, who still holds the office of deputy great chamberlain of England.

The office of lord chamberlain of the king's household is one which is held during his majesty's pleasure only; and the holder of it is usually changed with the administration. He has the control of all parts of the household, which are not under the direction of the lord steward, the groom of the stole, or the master of the horse; the king's chaplains, physicians, surgeons, &c., as well the royal tradesmen, are by his appointment; the companies of actors at the royal thea-[illegible] part of the household, are under his regulation, and [illegible] is also the licenser of plays.

CHAMBERS, EPHRAIM, was born at Kendal in the latter part of the seventeenth century. His father was a small freeholder in Westmoreland, in respectable circumstances. Ephraim, his eldest son, was bound apprentice to a mechanical trade in London. Eventually he became apprentice to Mr. Senex, the globe-maker; and it was while in his shop that he conceived the design of the Cyclopædia which has chiefly preserved his name. Some of the articles a[illegible] to have been writte[illegible] him while he stood behind the counter. Before the [illegible] the work, however, and probably after [illegible] agreement with the bookseller who publishe[illegible] Mr. Senex, and took chambers in Gray's Inn. [illegible] first edition of the Cyclopædia appeared [illegible]wo vols. fol. in [illegible] and was very favourably received. It was publish[illegible] subscription, the price of each copy being four guineas[illegible] immediately after, the author was made a Fellow of the Royal Society. A second edition of the work appeared in 1738, and a third in 1739. Mr. Chambers was also one of the writers in the 'Literary Magazine,' an analytical review of new works, which was begun in 1735, and cont[illegible] some years. He was likewise associated with Mr. [illegible] the botanical professor at Cambridge, in t[illegible] and abridging the 'Philosophical History and Memoirs of the Royal Academy of Sciences at Paris,' which appeared in five vols. 8vo, in 1742. This task he executed very ill. The only other literary work which has been attributed to him is a translation from the French of a quarto volume, entitled 'The Jesuits' Perspective.' He lived to the last the life of a recluse and a hard student, reading and writing from morning to night almost without intermission. A person who was his amanuensis for six years is said to have related that he transcribed for him, and took down from his dictation, in that space of time, not less than twenty large folio volumes, containing as much matter as, if it had been printed, would have made thirty such volumes as those of his Cyclopædia. He died on the 18th May, 1740, at Canonbury House, Islington, and was buried in Westminster Abbey, under a short Latin inscription of his own composition. A fourth edition of his Cyclopædia appeared in 1741, and a fifth in 1746. To the sixth edition, which was brought out in 1750, were added two supplementary volumes, which were compiled by Sir John Hill, the botanist, and George Lewis Scott, the mathematician. These, along with much new matter, were incorporated with the original work in [illegible]enth edition, which began to be published in numbers under the superintendence of the late Dr. Abraham Rees, in 1778, and was completed in four vols. folio, in 1785. Chambers's work is also avowedly the basis of the greatly more extended Cyclopædia in the conduct of which Dr. Rees afterwards engaged, and which he lived to complete in forty-five vols. 4to. (London, 1802-1819). Indeed it may be said to have originated all the modern Cyclopædias, both in the English and in other European languages. It was early translated both into French and Italian. In the prospectus of the great French *Encyclopédie* of Diderot and D'Alembert (afterwards incorporated in the *Discours Préliminaire*), it is admitted that Chambers's plan is excell[illegible] though the execution of the work is very indifferent. The writers add, that it possibly never would have appeared at all, if there had not previously existed in the French language works from which Chambers drew, without measure and without choice, the greatest part of the matter which composed his dictionary.

CHAMBERS, SIR WILLIAM, is said to have derive his descent from a Scotch family of the name of Cha[illegible] who were barons of Tartas in France. He was born ho[illegible]ever in 1726, at Stockholm, in Sweden; whither his grandfather, an eminent merchant, had proc[illegible] some time before, to prosecute certain claims he had [illegible] the government of that country. At two years of age he was brought to England, and put to school at Ripon in Yorkshire. We next read of his making a voyage to China as supercargo, in the service of the Swedish East India Company. This must have been when he was a very young man, for at the age of eighteen he is said to have settled in London, and taken up the profession of an architect and draughtsman. In these capacities, having no formidable rivalry to encounter, he soon obtained considerable reputation. At length he was introduced to the earl of Bute, and by his influence appointed drawing-master to the young Prince of Wales, afterwards George III. Soon after the accession of that king, he was employed to lay out the royal gardens at Kew. In this task he displayed without restraint that predilection for the Chinese style, both of gardening and architecture, of which he had already given intimation in a work, entitled 'Designs for Chinese Buildings,' published in 1759. In 1765 he published in a large folio volume, 'Plans, Elevations, Sections, and Perspective Views of the Gardens and Buildings at Kew, in Surrey.' Meanwhile he had also, by a villa in the Italian style, which he erected at Roehampton for the Earl of Besborough, and by various other buildings, obtained much reputation and employment as an architect. In 1771 [illegible] was [illegible] Swedish order of the Polar St[illegible] In [illegible] this 'Dissertation on Oriental Gardening,' [illegible] vindication of Chinese tastes and fashions, and is memorable as having exposed the author to the [illegible] lash of the poet Mason; to the first part of whose [illegible] Garden,' published immediately before, it was supposed to be intended as a sort of answer and confutation. The piece in which Mason took his revenge (if indeed h[illegible] was the author, which he never acknowledged) was the [illegible] 'Heroic Epistle to Sir William Chambers, Knight, [illegible] ller General of his Majesty's Works, and author of [illegible] rtation on Oriental Gardening; enriched with [illegible] es, chiefly extracted from that elaborate [illegible] production appeared in 1773, and was followed in 1774 by a short continuation, under the title of 'An Heroic Postscript.' The satire, however, does not seem to have injured its object in any essential respect. In 1775 Sir William was appointed to superintend the rebuilding of Somerset House, which is his best work. In 1791 he published his 'Treatise on Civil Architecture,' of which two new editions, one by Joseph Gwilt, F.S.A., the other by an anonymous editor, appeared in 1824. Each contains considerable additions to the original work. Sir William died on the 8th of March, 1796, leaving a large fortune. As an architect, although his taste was fantastic, he frequently showed considerable ingenuity, and also displayed a certain grandeur in his designs. His staircases in particular used to be much admired. In the time of Sir W. Chambers, pure Greek architecture was only beginning to be known in England, and its introduction was at first not much favoured. The recent indiscriminate adoption of Greek models for public buildings in London has filled the metropolis with structures totally unsuited in external form to improve the appearance of a large city, and often ill adapted in their internal arrangements to the purposes for which they are designed. Instead of large masses and lofty buildings, the streets of London are crowded with mean porticoes and pigmy pillars, attached to edifices of so little elevation, and so much cut up into small parts, as to lose by comparison with many of the adjoining houses. The street-front of Somerset House is in all respects better adapted to a great city than the Greek models which are now generally adopted. After Somerset House, among Chambers's most successful efforts, are the mansion which he built for the marquis of Abercorn at Duddingstone, near Edinburgh, and Milton Abbey in Dorsetshire, which he built in the Gothic style for Lord Dorchester.

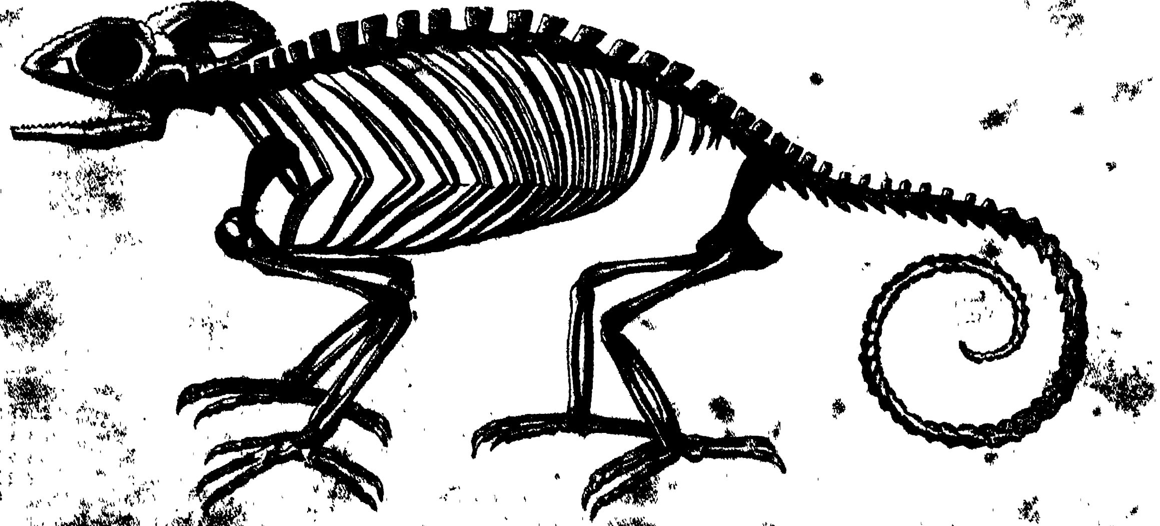
CHAMBE'RY, the capital of the province called Savoy Proper, is also the most considerable town in all Savoy, and the residence of the military governor of that Duchy, and of the senate or high court of justice for all its provinces. [Savoy.] It lies, at an elevation of 930 ft. above the sea, in a fine valley, between two ridges which run N.W. and S.E., from the Rhone to the Isère, and may be considered as lower offsets of the Alps. The valley is watered by the river Leisse which falls into the pretty lake of Bourg, eight miles N.W. of Chambery. The valley from Bourget to Montmélian is [illegible]t eighteen miles long and three broad. It abounds with [illegible]s, and the lower part is rich in pastures, but is subject [illegible]dden inundations from the swelling of the mountain [illegible]ms. The climate is mild, being sheltered from the N. winds. Chambery has a royal college, kept by the Jesuits; an academy of sciences, called the Academy of Savoy, which publishes its memoirs; a society of agriculture and commerce; a public library, with a cabinet of natural history; and a school of drawing. There are many hospitals, houses for refuge, and other charitable institutions; several of which were founded by a native, General de Boigne, who after an adventurous career in India in the last century, returned home with a large fortune, of which he devoted several millions of francs to improve his native city. He died a few years ago at his residence of Buisson Rond, near Chambery. The churches of Chambery have some good paintings. The population of the town and suburbs is about 11,000. (*Calendario Sardo.*) Many families of the nobility of Savoy, some of them very antient, reside in this town. The people of Chambery speak remarkably good French, but the country people have a patois which is a dialect of the Romance language. Provisions are cheap, which is generally the case in Savoy, where incomes are very moderate. Many beggars, especially of the class of country people, are seen in the streets of Chambery. Amadeus V. was the first duke of Savoy who established his residence here. This town has produced many distinguished men; among others, the Abbé de St. Réal, Vaugelas, Albanis Beaumont, known for his travels in the Alps; the painters Berenger and Berger; and the two Counts de Maistre, Xavier and Joseph, well-known in contemporary literature. (Bertolotti, *Viaggio in Savoja.*)

CHAMBORD. [Loir et Cher.]

CHAMECK. [Ateles, Species 8.]

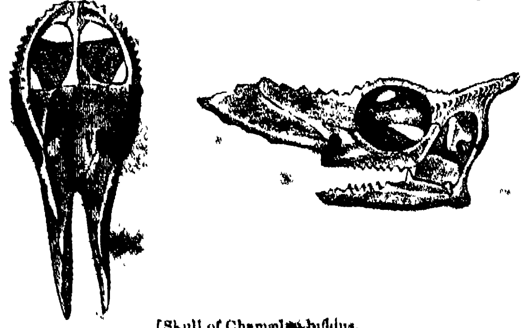
CHAMELEONS, CHAMELEON-TRIBE; CHAMÆLEONIDÆ (Zoology), the name for a well-defined family of Saurians (lizard-like reptiles), whose differential and essential characters may be summed up as existing in the form of their feet, the toes of which are joined or bound up together in two packets or bundles opposed to each other—in their shagreen-like skin—in their prehensile tail and in their extensile and retractile vermiform tongue.

Organization, Skeleton.—The more striking peculiarities consist in the elevated and pyramidal form of the *occiput*, the absence of a true *sternum*, and in certain apophyses of the vertebral column, especially about the tail, where they are placed *en chevron*, so as to leave at their base a space where the caudal artery, a prolongation of the pelvic, is protected somewhat in the same way as the spinal chord is by the bony case above it, when the prehensile tail would otherwise subject it to pressure in grasping boughs of trees or other solid bodies with its lower surface. The transverse apophyses of the tail are but little developed. The glenoid cavity is supported upon a short pedicle. The majority of saurians have eight cervical vertebræ, but the chameleon,



[Skeleton of Chameleon.]

have only five. The first ribs are joined to the mesial line, which performs the office of a sternum, and the following ribs are united to each other by their cartilaginous prolongations towards the mesial line of the belly, so as to protect the abdomen by an entire bony circle. There are, [illegible] Schneider has observed, but two shoulder-bones, of which the coracoïd is very small, the clavicle being entirely absent. Cuvier remarked the singular disposition of the wrist. The two carpal bones which come next to those of the fore-arm are articulated upon one large central piece, which receives the five bones which correspond to the metacarpal, three of these being for the external toes and two for the internal, thus forming two opposable prehensile instruments, the two bundles being bound up in the integuments and skin to the very claws. In the *pelvis*, the *ilia* are long and slender and directed towards the *sacrum*, with which they partially unite, but are prolonged by a cartilage. The hind as well as the fore toes are five, and disposed in the same manner as those of the anterior extremities. The trunk, which has a compressed appearance, is mounted high on the legs, forming an exception to the majority of reptiles, whose belly touches the ground.



[Skull of Chamæl[illegible] bifidus,

Organs of respiration.—Cuvier observes that their lung is so large that, when it is filled with air, it imparts a transparency to the body, which made the antients say that it lived upon air, and he inclined to think that to its size the chameleon owed the property of changing its colour; but with regard to this last speculation he was in error, as we shall presently see.

Organs of nutrition and digestion.—The teeth, as in the great majority of saurians, have no true roots: their crowns, which are trilobated *, seem to be soldered as it were upon the edge of the upper border of a groove hollowed in the maxillary bone; they are connected to the osseous portion and also to each other, so as to present the appearance of an enamelled and denticulated portion of the edge of the bone. But it is the vermiform extensile and retractile tongue which is the chief organ for taking the insects on which the chameleon lives. By a curious mechanism, of which the *os hyoïdes* (tongue-bone) is a principal agent, the chameleon can protrude this cylindrical tongue, which is terminated by a dilated and somewhat tubular tip covered [illegible]atinous secretion, from the sheath at the lower part of the mouth, where the whole of the tongue, with the exception of the dilated tip, remains when at rest, to the length of six inches. When the chameleon is about to seize an insect it rolls round its extraordinary eyeballs so as to bring them to bear on the devoted object; as soon as it arrives within range of the tongue that organ is projected with unerring precision and returns into the mouth with the prey adhering to the viscous tip. Some writers speak of the wonderful celerity with which this feat is performed, and it certainly forms a strong contrast to the other almost ridiculously slow motions of the animal. We have never seen chameleons take a fly, but we have often seen them catch meal-worms; and the operation, though comparatively rapid, was not remarkable for its quickness, but done with an air of deliberation, and so that the projection and retraction of the tongue could be very distinctly followed with the eye.

[Chameleon taking his prey.]

There is not much difference between the *œsophagus* and stomach, which latter is sm[illegible] and bent back upon itself. There is no true *pylorus*, [illegible] the point where [illegible] should be, a sort of [illegible] the [illegible] there thickened.

Organs of Sense. [illegible] the under surface of the tail and toes are granulated *papillæ*, [illegible]bly for the purpose of conveying to the *sensorium* [illegible]re of the body grasped. The tongue must have a considerable share of the sense of *touch*; whether it has any high perception of that of *taste* may be doubted. *Smell.*—Most probably not acute; the external orifices of the nostrils are more lateral, and consequently wider apart than in most of the other saurians. *Hearing.*—There is no [illegible] external ear, but an internal cavity not much developed [illegible] bones of the sides of the skull, communi[illegible] throat, and covered externally by the common integument. *Sight.*—The eyes of the chameleon are remarkable objects projecting, and almost entirely covered with the shagreen-like skin, with the exception of a small aperture opposite to the pupil: their motions are completely independent of each other. It adds to the strange and grotesque appearance of this creature, to see it roll one of its eye-globes backwards, while the other is directed forwards, as if making two distinct surveys at one time. Its sight must be acute, from the unerring certainty with which it marks and seizes its prey.

Reproduction.—By means of eggs, which are numerous at each deposit, oval, and enveloped in a white, tough, parchment-like skin.

Habits, &c.—The chameleons spend their lives in trees, for clinging to the branches of which their organization is admirably adapted. There they lie in wait for the insects which may come within their reach; and it is highly probable that, in such situations, their faculty of changing their colour becomes highly important in aiding them to conceal themselves. Of this faculty, concerning which so much has been written and said, we shall presently treat. The powers of abstinence possessed by this singular race are very great, and hence most probably arose the old fable of their living on air, which was for a long time considered to be 'the chameleon's dish.' We kept one for upwards of six weeks, and during all that time it never, as far as we could observe, took any sustenance, though meal-worms, and other insects were procured for it. Notwithstanding this fast, it did not appear to fall away much. It would fix itself by the feet and tail to the bars of the fender and there remain motionless, apparently enjoying the warmth of the fire for hours together. Its motions were excessively slow. It was a female, and died after laying a great number of eggs. Hasselquist describes one, that he kept for ne[illegible]onth, as climbing up and down the bars of its cage in a very lively manner.

That the chameleon was known to the antients there is no doubt. It was the χαμαιλέων of the Greeks and the *chamæleo* of the Latins. Aristotle's history of the animal proves the acute observation of that great zoologist, for he notices the peculiarities of the animal, the absence of a [illegible] sternum, the disposition of the ribs, the mechanism [illegible] tail, the motion of the eyes, the toes bound up in opposable bundles, &c., &c., though he is not entirely correct in some points. (*Hist. Anim.*, book 2, ch. xi.) Pliny (*Hist. Nat.*, lib. viii., c. 33) mentions it, but his account is for the most part a compilation from Aristotle.

Power of changing colour.—Passing by the earlier statements of those who have written on the subject, we shall commence with the details of modern times. Wood, in his 'Zoography,' gives the following translation of the account given by the French academicians of this phenomenon: 'The colour of all the eminences of our chameleon when it was at rest, in the shade, and had continued a long time undisturbed, was a bluish grey, except under the fe
it was white inclining to yellow; and the interva
granules of the skin were of a pale and yellowish red.
grey, which coloured all the parts exposed to the
changed when in the sun; and all the places of
which were illuminated, instead of their bluish col
came of a brownish grey, inclining to *minime*. The rest of the skin which was not illuminated by the sun changed its grey into several brisk and shining colours, forming spots about half a finger's breadth, reaching from the crest of the spine to the middle of the back; others a[illegible] on the ribs, fore legs, and tail. All these spots we[illegible] Isabella

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* But see post, p. 475.

colour, through the mixture of a pale yellow wit the granules were [illegible] bright red, which i of the bottom of [illegible] which is visible betwe nules; the rest of the [illegible] lightened by the which was of [illegible] grey than ordinary, resembled a cloth made of mixed [illegible] some of the granules being greenish, others of a [illegible] grey, and others of the usual bluish grey, the ground remaining as before. When the sun did not shine, the first grey appeared again by little and little, and spread itself all over the body, except under the feet, which continued of the same colour, but a little browner; and when, being in this state, some of the company handled it, there immediately appeared on its shoulders and fore legs several very [illegible] spots about the size of a finger nail, and which did not take [illegible] when it was handled by those who usually took care of it. Sometimes it was marked with brown spots, which inclined towards green. We afterwards wrapped it up in a linen cloth, where having been two or three minutes, we took it out whitish; but not so white as that of which Aldrovandus speaks, which was not to be distinguished from the linen on which it was laid. Ours, which had only changed its ordinary grey into a pale one, after having kept this colour some time, lost it insensibly. This experiment made us question the truth of the chameleon's taking all colours but white, as Theophrastus and Plutarch report; for ours seemed to have such a disposition to retain this colour, that it grew pale every night, and when dead it had more white than any other colour; nor did we find that it changed colour all over the body as Aristotle reports; for when it takes other colours than grey, and disguises itself to appear in masquerade, as Ælian pleasantly says, it covers only certain parts of the body with them. Lastly, to conclude the experiments relative to the colours which the chameleon can take, it was laid on substances of various colours and wrapped up therein; but it took not them as it had done the white, and it took that only the first time the experiment was made, though it was repeated several times on different days. In making these experiments, we observed that there were a great many places of its skin which grew brown, but very little at a time: to be certain of which, we marked with small specks of ink those granules which to us appeared whitest in its pale state, and we always found that when it grew brownest and its skin spotted, those grains which we had marked were always less brown than the rest.'

The details of this experiment should be borne in mind when reading the interesting memoir of Mr. Edwards, to which the reader is afterwards referred.

[illegible] thought that the changes of colour depended on a kind of disease, more especially a sort of jaundice to which the animal was subject, particularly when it was put in a rage.

[illegible] Obsonville thought that he had discovered the secret in the blood. He considered that the change of colour depended upon a mixture of blue and yellow, whence the different shades of green were derived, and these colours he obtains from the blood and the blood-vessels. Thus he says that the blood is of a violet blue, and will retain its colour on linen or paper for some minutes if previously steeped in a solution of alum, and that the coats of the vessels are yellow both in their trunks and branches; consequently, he argues, the mixture of the two will produce green. He further traces the change of colour to the passions of the animal. When, he observes, a healthy chameleon is provoked, the circulation is accelerated, the vessels that are spread over the skin are distended, and a superficial blue green colour is produced. When, on the contrary, the animal is imprisoned, impoverished, and deprived of free air, the circulation becomes languid, the vessels are not filled, the colour of their coats prevails, and the chameleon changes to a yellow green, which lasts during its confinement.

Mr. Barrow (*African Travels*) declares, that previously to the chameleon's assuming a change of colour, it makes a long inspiration, the body swelling out to twice its usual size, and as this inflation subsides, the change of colour gradually takes place; the only permanent marks being two small dark lines passing along the sides. Mr. Wood conceives from this account, that the animal is principally indebted for these varied tints to the influence of oxygen.

Mr. [illegible] also regards these changes as connected with the [illegible] lungs; and Mr. Houston considers this phenomenon as dependent on the turgescency of the skin.

Not to go farther into the numerous treatises and memoirs which have been published on this intricate subject, without arriving at a just conclusion, we refer to the conclusion of the able and interesting paper of Mr. Milne Edwards, for whose acuteness the solution of this puzzling phenomenon was reserved. It appeared in the 'Annales des Sciences Naturelles' for January, 183[illegible] and translated in the seventeenth volume of the 'Edinburgh New Philosophical Journal,' p. 31[illegible]. The steps by which he first overthrew the received theories on the subject, and then arrived at a knowledge of the cause of the change of colour, are so clearly stated, that we recommend our readers to study the whole memoir, the results of which only we give here.

1. That the change in the colour of chameleons does not depend essentially either on the more or less considerable swelling of their bodies, or the changes which might hence result to the condition of the blood or circulation; nor does it depend on the greater or less distance which may exist between the several cutaneous tubercles; although it is not to be denied that these circumstances probably exercise some influence upon the phenomenon.

2. That there exists in the skin of these animals two layers of membranous pigment, placed the one above the other, but disposed in such a way as to appear simultaneously under the cuticle, and sometimes in such a manner that the one may hide the other.

3. That every thing remarkable in the changes of colour that manifest themselves in the chameleon may be explained by the appearance of the pigment of the deeper layer to an extent more or less considerable, in the midst of the pigment of the superficial layer; or from its disappearance beneath this layer.

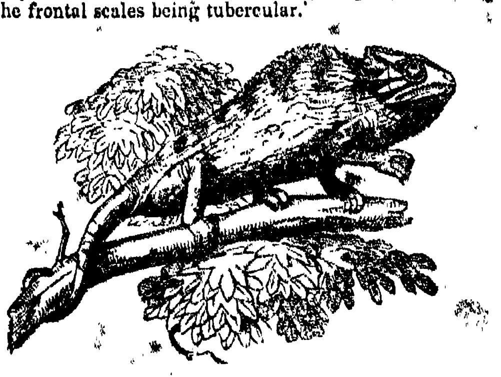
4. That these displacements of the deeper pigment do in reality occur; and it is a probable consequence that the chameleon's colour changes during life, and may continue to change even after death.

5. That there exists a close analogy between the mechanism by the help of which the changes of colour appear to take place in these reptiles, and that which determines the successive appearance and disappearance of coloured spots in the mantles of several of the cephalopods.

Geographical distribution. Warm climates of the old world, South of Spain, Africa, East Indies, Isles of Sechelles, Bourbon, France, Moluccas, Madagascar (where it is said that there are seven of the species which belong to Africa). Fernando Po, and New South Wales.

Species. The family consists but of one genus, *Chamæleo*, but there are several species. We select *Chamæleo vulgaris* as an example. Localities, Africa and India. Egypt, Barbary and South of Spain, *Cuvier*. Central Africa, *Col. Denham*. India, *Gen. Hardwicke.* Tripoli, *Mr. Ritchie.* Egypt, *Geoffroy*.

See General Hardwicke's and Mr. Gray's paper on the saurian reptiles of India in the Zoological Journal, vol. iii, p. [illegible], where it is observed that the teeth are rarely (as they are described to be by Cuvier) slightly three-lobed. 'When the animal is alive and in health, the angles of the occipital pyramid and the lines on the side of the face are completely obliterated. It is distinguished from a species from Central Africa, by the occipital keel extending to the centre of the eye, by the back of the head being only slightly lobed, and by the frontal scales being tubercular.'



[Chamæleo vulgaris.]

Systematic arrangement. Most zoologists seem to consider the *Chamæleonidæ* as an isolated family. Linnæus placed the Chameleon—he seems to have been aware of but one species—in his extensive genus *Lacerta*, under which and *Draco*, he arranged all the saurians known him. Oppel (1811) placed the chameleons in his third family, the *Iguanoïdes*. Merrem (1820) formed for them his fifth tribe, the *Prendentia*. De Blainville (1822) arranges them among his *Agamoïdes Anormaux*. Latreille (1[illegible] made them the fourth and last family, immediately following his *Geckotians* of his second order of scaly reptiles, *Les Lacertiformes* (lizard-shaped). Mr. Gray, who has contributed some new species, divided (1825, 1831) the saurians, properly so called, [illegible] five families of two sections, placing the *Chamæleonidæ* as the last family of the second, next to the *Lacertinidæ*. Fitzinger (1826) arranges them under his second tribe, *Squamatæ*, of which they are the second family between the *Geckos* or *Ascalabotoïdes*, and the *Pneustoïdes*. Cuvier (1829, 2nd vol. of last edition of Règne Animal) arranges them as his fifth family of saurians between the *Geckos* and the *Skincks*. Wagler (1830) places them as the first subdivision, the *Acrodontes*, of his fourth tribe, *Thecoglossi**, of his third order, *The Lizards*. Wiegmann (1834) who, as well as Wagler, makes the structure of the tongue an important element in his classification of this branch, arranges them in the second series, *Rhipthoglossi*† of his second sub-order *Squammati*. Duméril and Bibron, in the arrangement proposed by them (1835), consider the chameleons and the geckos as two groups absolutely anormal, and name the former *Cameleoniens* or *Chélopodes*, the latter name being derived from the supposed resemblance of their claws to a pair of pincers.

Those who would wish to go further into the history and structure of this extraordinary family may consult the works of the following authors, in addition to those above alluded to:—Gesner, Perrault, Daudin, Laurenti, Lacépède, Brongniart, Vallisnieri, Tiedemann, Vander Hoeven, Bruyn, Frentzel, Goddard, Hopfer, Hussem, Kaalund, Kircher, Major, Meyer, Oken, Parsons, Voigt.

CHAMOIS. [ANTELOPE, Group xiv. Species 48.]

CHAMOMILE. [ANTHEMIS.]

CHAMOND, ST., a town in the department of Loire in France, on the bank of the little river Gier, a tributary of the Rhône, and on the road between the great manufacturing towns of Lyon and St. Etienne, 25 or 26 miles from Lyon and about 7 from St. Etienne: it is in 45° 1′ N. lat. and 4° 30′ E. long.

The population of St. Chamond in 1832 was 7475; the inhabitants are employed in various branches of the silk manufacture, especially in making ribands and laces, of which there are more than thirty manufactories. In the suburb of St. Julien are some considerable iron works. The town has a handsome church, a *place* or square surrounded by trees, forming a promenade, and baths. In the environs are some vestiges of Roman antiquities. In the neighbourhood there are extensive coal-pits, and quarries of stone for building.

CHAMOUNY, or CHAMONIX, an Alpine valley in Savoy, at the foot of Mont Blanc. It runs north-east and south-west, being in length about thirteen miles, and about two in breadth: it is watered by the Arve, which has its source in the Col de Balme, at the north-east extremity of the valley. The Arve is joined in the middle of the valley by the Arveron, which issues out of the glacier of Montanvert. The valley is bounded to the east and south-east by the great chain of the Pennine Alps, which divides this part of Savoy from the Val d'Aosta in Piedmont, forming a succession of lofty peaks, called Aiguilles (Needles), covered with perpetual snow, and known by the names of Aiguilles de Tour, Argentière, Verte, Dru, Aiguille du Midi, and lastly Mont Blanc, which rears itself high above the rest, at the south-west extremity of the valley. The clefts between these different mountains are the receptacles of extensive glaciers, which slope down to the very edge of the fields of the valley of Chamouny. The principal one, called La Mer de Glace, spreads itself between two parallel masses of the great chain, formed by the Géant and Lorasse on one side, and the Dru, Montanvert, Charmoz, and Aiguille du Midi on the other. The length of this icy sea is about six miles, and its greatest breadth about two miles. A branch of it slopes down through an opening between the Dru and the Montanvert towards the valley of Chamouny. On the west side, the valley of Chamouny is bounded by the Brevent, [illegible] feet high, which is an offset of the group of the Buet, the summit of which is covered [illegible] snow, and which di- [illegible] valley of the Arve [illegible] that of the [illegible] good mountain [illegible] ascend the Bre[illegible]t, [illegible] which there is [illegible] view of the great [illegible] with all its [illegible] and glaciers, as well as of the gr[illegible] the Buet [illegible] the nort[illegible] of the other mountains [illegible] the interior of Savoy. Ot[illegible] without ascending to the summit of the Brevent, content themselves with riding on mules up a steep zigzag to the Croix de la Flegere, a station on the side of the mountain, from which the view of the opposite chain is also remarkably good. The view from the bottom of the valley itself is too confined (the mountains rising abruptly like walls about it) to give a just idea of the extent and height of that [illegible] of Alps. The Montanvert is ascended on [illegible] the sea of ice may be reached, but the latter part of the excursion is not without some risk, on account of the numerous crevices in the ice, which are of unfathomable depth; strangers who venture on the glaciers should trust implicitly to their guides. Some adventurous travellers, and two English ladies among the rest, have of late years crossed the sea of ice, and then ascending the Col du Géant, 10,000 feet, descended to Cormayeur, in the Val d'Aosta.

The road from Geneva to Chamouny follows the course of the Arve by Bonneville, Cluse, St. Martin, Chede, and Servoz. The approach to the valley of Chamouny from St. Martin is nearly as interesting as the valley itself. The cascade and little lake of Chede, and the scenery about Servoz, are remarkably fine. Travellers put up at the Prieuré, which is the principal village in the valley of Chamouny, and contains two very good inns, where one meets with numerous company from all parts of Europe. Each party of travellers engage a guide, with mules; the pay of a guide is fixed at six francs a-day, and as much for each mule. The guides are generally very civil and trustworthy; they are all tried men, and are licensed by the local authorities. From Chamouny one may, without retracing his steps back to Geneva, proceed to Martigny in the V[illegible] on the high road from Geneva to the Simplon. [illegible] practicable for mules lead to Martigny; the most [illegible] is over the Col de Balme, [illegible]200 feet above the sea, into the valley of Trient, in the Valais. The other path leads through the secluded valley called Valorsine, and then over La Tête Noire, likewise to Trient. From Trient the path leads over the mountain called La Forclaz, from which there is a fine view of the lower Valais and the opposite chain of Alps in the Oberland, and then to Martigny. The journey from Chamouny to Martigny is easily made in one day.

Besides Le Prieuré, which derives its name from a former Convent of Benedictines, founded in 1099, the valley of Chamouny has several other villages or hamlets, such as La Tour, Argentière, Les Près, Bossons, Ouch[illegible]. The whole valley contains about 2700 inhabitants, and is divided into four parishes. (*Calendario Sardo*, 1825.) It produces some barley and oats, but the chief property of the inhabitants consists in cattle; very good honey is also got here. From one to two thousand strangers visit this valley every summer, and their expenditure forms an important addition to the income of the natives. At the Prieuré are collections of minerals, crystals, amethysts, topazes, and other fine stones, which are found in the mountains. The village of the Prieuré is, according to Saussure, 3346 feet above the sea, so that the perpendicular height of Mont Blanc above the level of the valley is 12,386 feet, an elevation greater than that of the Chimboraço and other summits of the Andes above the plains immediately below them. O[illegible] however to the vast buttresses which Mont Blanc throws out towards the valley of Chamouny, its height does not strike so much on this side as on its south or Italian side, towards the narrow valley called Allée Blanche and Val d'Entrèves, where it rises more abruptly, and in a single mass. [illegible] branching out of the road from Geneva to Chamo[illegible], Sallenche, and passing by St. Gervais and Contam[illegible], over the Col de la Seigne, 8000 feet above the sea, leads by the Allée Blanche and the Val d'Entrèves to Corm[illegible] in the Val d'Aosta; but the excursion is laborious a[illegible] without danger, except in the very middle of summer and in very fine weather.

The valley of Chamouny was not frequented by travellers till about the middle of the last century, when Saussure, Deluc, and above all Bourrit, made its beau[illegible], as well as its advantages, as a station from wh[illegible] explore the group of Mont Blanc. In one respect [illegible]

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* Having the tongue in a sheath.

† Having a projectile or protractile tongue.

Chamouny is inferior to the [illegible] Alpine valleys of the Bernese Ober[illegible] other parts of central Switzerla[illegible] has no waterfalls, but [illegible] stillness in its scenery adds to its imposing effect.

CHAMP, a [illegible] kind of timber, [illegible] the East Indies by M[illegible] excelsa.

CHAMP DE [illegible]. [Pa[illegible].]

CHAMPAGNE, one of the provinces of France, important from its extent and interesting from the former greatness of its feudal lords. It was bounded on the N. by Luxembourg and Namur, districts of the Low Countries; on the E. by the B[illegible]rois and other parts of Lorraine; on the S.E. by Franche Co[illegible]; on the S. by Bourgogne; on the S.W. by the G[illegible] a district partly included in Orléanois and partly in [illegible] France); on the W. and N.W. by Brie Fran[illegible] and other parts of the Isle of France, and by Picardie. [illegible] greatest length from N. by W. to S. by E. was nearly [illegible]0 miles: its greatest breadth, nearly at right angles to the above, about 150 miles. It was subdivided into eight districts, viz.: Rethelois in the N., including the towns of Rethel, population 6585; and Mézières, 3737; and extending to Givet and Charlemont, 40[illegible]. Brie Champenoise, including Meaux, 8481; and Provins, 5665, on the W.; Senonois, including Sens, 9267; Joigny, 4700; and T[illegible]re, 37[illegible]; on the S.: Bassigny, including Chaumont, 6104; and Langres, 5960; on the S.E.: Vallage, including Joinville, [illegible]15; and Pertois, including Vitry Le François, 6976; and Sainte Menehould 2933; on the E.: and Champagne Proper, including Epernay, 5318; Châlons 12,413; and Troyes 23,749: and Rémois, including Reims, 3597, in the centre. The population of the above towns is from the census of 1832, except that of Sainte Menehould, which is from that of 1826.

The greater part of Champagne is comprehended in the basin of the Seine, by which, and by its tributaries, the Marne, the Aube, and the Yonne, it is watered. To these rivers we may add the Aisne (a feeder of the Oise), with its tributaries the Suippe and the Vêle, the Armançon, and the Serein, feeders of the Yonne; and the Meuse, which waters the north-eastern and northern parts. The Seine, Aube, Marne, Aisne, Yonne, and Meuse are navigable.

Champagne, as its name implies, is a flat country: the elevations are few and inconsiderable. The soil varies considerably; part of it is barren, producing only oats, rye, and buckwheat, and of these but inferior crops. Yet on the whole, the crops of grain in the departments into which Champagne has been divided (Aisne, Ardennes, Aube, Marne, Haute Marne, and Yonne), exceed considerably the average produce of France; and the wines of Champagne enjoy the highest reputation. Wood abounds in some places, while in others the inhabitants experience great scarcity of [illegible] and of other building materials. Other parts abound with pools. The whole country may be considered as well stocked with poultry, game, and fish. There is considerable pasturage, and the number of horses and sheep in the departments above mentioned exceeds the average of the departments in France. For further information [illegible]s to the soil, productions, &c., of Champagne the reader [illegible] referred to the accounts of the departments already named.

History of Champagne. At the period of Cæsar's invasion of Gaul, the country, afterwards known as Champagne, was divided between the two great races of the Celtæ or Galli properly so called, and the Belgæ; the Matrona, or Marne, [illegible] their common boundary. Of the Belgic tribes the [illegible] were the most important, especially after their early-formed and faithfully-kept alliance with the Romans had secured to them the patronage of that powerful people. The Catalauni (supposing such a people really to have existed) [CHALONS SUR MARNE] were probably a subdivision of the Remi. These tribes gave name to Reims and Châlons. Of the Celtic race were the Senones, the Tricasses, and the Lingones who have given name to the towns of Sens, Troyes, and Langres. It is not clear to us whether the [illegible], who inhabited the eastern part of the province, were [illegible] Celtic or Belgic race.

In the division of Gaul by the Roman emperors this district was divided between the provinces of Lugdunensis Prima and Quarta (or Senonia), and Belgica Prima and Secunda. The boundaries of the Roman provinces called Lugdunensis or Celtica, and Belgica, are not to be regarded as quite [illegible]nt with the boundaries of the Celtic and Belgic ra[illegible]

Champagne was one of the parts of Gaul which remained longest in the possession of the Roman emperors. After the Burgundians and Franks had crossed the Rhine and acquired settlements in that country, and the south and west parts had been occupied by the Visigoths, nay even after the Roman empire itself had fallen, and the last Cæsar of Rome had [illegible]erson of Augustulus (A.D. 476), Ægidius and his son [illegible]ius, who governed this part of Gaul in the name [illegible]peror of the West, continued in possession of the [illegible]y and still upheld the Roman name. However, [illegible]ius was defeated by Clovis and Ragnacarius, [illegible]erated princes of the Franks, and Champagne became [illegible]ion of the extensive kingdom over which Clovis reigned. After the death of Clovis (A.D. 5[illegible]) it became part of the kingdo[illegible]ustrasia, one of those into which the states acquired and ruled by him were dismembered.

It was probably about this time that the designation of Champagne (in Latin Campania, an open country) was given to the district. We read in the antient historians of Campania Remenesis (from Remi or Reims) Campania Catalaunensis (from Catalauni or Châlons), and Campania Tullensis (from Tullum or Toul), of which the last must have been in Lorraine. It is in the works of Gregory of Tours (an historian of the 6th century) that the name, as we believe, first occurs. We read of several dukes of Champagne during the continuation of the Merovingian dynasty. The last of these were of the family of Pepin l'Heristal, mayor of the palace of Austrasia, one branch of whose posterity shortly after ascended the throne, and are known as the princes of the Carlovingian dynasty. The dissensions of this family appear to have brought the ducal dignity to an end before the Carlovingians ascended the throne.

Under the Carlovingian princes the great officers of the provinces and governors of the towns contrived in many cases to render their power hereditary; their dependents managed to do the same; and even the archbishops and bishops made themselves masters of the towns which were the capitals of their diocese. The archbishops of Reims and Sens obtained the chief power in Champagne. The rise however of the powerful house of Vermandois repressed the ambition of the prelates, obliged them to give up their temporal power, and finally obtained the pre-eminence in Champagne. In the early part of the 10th century Horbert, or Heribert II., count of Vermandois, became, according to Baugier (*Mémoires Historiques de la Province de Champagne*), first sovereign and hereditary count of Champagne and Brie. He appears to have entitled himself count of Troyes and Meaux. He was an active participator in the troubles which marked the reign of Charles le Simple, whom, by an act of treachery, he made his captive. Disgusted by the refusal of a fief which he had asked of Raoul, who succeeded to the throne upon the captivity of Charles, he released the latter; but, shortly afterwards, having come to an accommodation with Raoul, he sent Charles back into confinement, in which he died A.D. 929. The ambition of Heribert involved him in new troubles with Raoul and with Hugues or Hugh, count of Paris and duke of France, the most potent lord of his time, and brother-in-law of Heribert: with this last, however, Heribert formed an alliance against the king Louis IV. Outre Mer, who was continually involved in disputes with the powerful aristocracy of his kingdom. Heribert died A.D. 943.

The death of Heribert seems to have been the signal for hostilities on the part of the king, and of others who had cause of quarrel with the deceased count. Among these was Artaud, archbishop of Reims, whom Heribert had deposed in order to place his son Hugues in the see. We find the rival claimants to the archbishopric engaging actively in these hostilities. The children of Heribert were protected by their uncle Count Hugues of Paris; and two of them were successively counts of Champagne. About 1019 the county of Champagne came, upon the extinction of the male line of Heribert, to Eudes, or Odon, who was by his mother's side great-grandson of Heribert: he inherited of his father the counties of Blois, Tours, and Chartres. It does not appear that these lords of the greater part of Champagne bore as yet any other title than that of Counts of Troyes and Meaux, though their power was such as to enable them to rank among the great lay peers of France, even before the union of Blois, Tours, and Chartres; and after that union Eudes was able to enter into a contest with the king of France, Henry I., and to struggle with the Emperor Conrad the Salic for the successi[illegible] the kingdom of Bourgogne. [illegible] also aspired to possess [illegible]self of the crown of Lorraine. [illegible]ese contests were not however successful; and the death of Eudes, who fell in battle November, 1037, fighting against the troops of Cothelon, duke of Lorraine, put a stop to his ambitious designs.

Upon the death of Eudes the county of Blois was separated from Champagne, his inheritance being divided between two of his sons, Etienne and Thibaut; but the death of the former reunited the whole in the hands of Thibaut I., who had inherited Blois, and seized Champagne, to the prejudice of Eudes the son of Etienne, as if to compensate for the loss of the county of Tours, which he had been obliged to cede to the count of Anjou. The death of Thibaut, A.D. 108[illegible] first who took the title of the Count of Champagne, led to a fresh separation of these possessions, which were however, A.D. 1125, re-united in the person of Thibaut II., count of Blois. The city of Troyes owes much of its importance to the favour of this prince, who established the first manufactures of that city, and distributed the waters of the Seine throughout the place by an immense number of channels, in order to supply the various workshops. He died A.D. 1152. According to some, this prince was the first who was properly count of Champagne.

Henry I., son of Thibaut II., had, during his father's life, accompanied Louis VII. of France to Palestine in the second crusade (A.D. 1147). He visited Palestine a second time as a champion of the cross, A.D. 1178; but his expedition was unfortunate. He was made prisoner in Illyria on his return home, and though released by the Emperor of the East, his health suffered so much from his toils and sufferings that he died seven days after his return to France, A.D. 1181. Meaux owes to him its municipal government. He was count of Champagne, but not of Blois, which his younger brother, Thibaut le Bon, inherited. Henry I. retained the authority of suzerain over the county of Blois.

Henry II., son of Henry I., succeeded his father. In 1190 he set out for the Holy Land, and was present at the great siege of Acre. He served with Richard I. of England, by whose influence he was nominated king of Jerusalem. He died in consequence of falling from a window of his palace at Tyre, A.D. 1197, and was succeeded in the county of Champagne by his brother Thibaut III. The latter swore allegiance to Philippe Auguste, king of France, yet supported Richard of England against that monarch. In 1199 he took the cross, but died A.D. 1200 or 1201 before he could set out with the crusade of which he had been appointed the chief.

Thibaut IV., posthumous son of Thibaut III., possessed the county of Champagne from his birth, A.D. 1201, to his death, A.D. 1253. He was involved in almost perpetual broils with the other great nobles of France. In 1234 he became by inheritance through his mother king of Navarre. In 1239 he went as a crusader to the Holy Land, but the dissensions of the generals caused the failure of the expedition.

Thibaut V., son of the late prince, succeeded to the county of Champagne and kingdom of Navarre, as well as to the hereditary predilection of his family for crusading expeditions. He accompanied St. Louis to Tunis, and died on his way home at Trapani in Sicily, A.D. 1270. Henri III., his brother and successor, died 1274; Jeanne, daughter and heiress of Henri III., married Philippe IV. *le Bel*, king of France; and by the consequences of this marriage the county of Champagne became united to the crown of France. The marriage took place A.D. 1284, and with it ends the history of this province.

CHAMPAGNE-WINE is the produce of the vineyards of the departments of the Marne, Haute Marne, Ardennes, and Aube, which were comprehended in the ancient province of Champagne. Of the various growths of Champagne, that made on the banks of the Marne has the highest reputation, and forms the greater part of what is sent to foreign countries. Champagne wine is light in body, containing on the average, according to M. Brande, only 12·61 per cent. of alcohol; it is of various colours, white, straw-colour, pink, and red; and these again are divided into sparkling, creaming, and still, or as they are called in France *mousseux*, *crêmant* and *non-mousseux*. The red wines of good quality are, for the most part, exported to Belgium, and the white to England, Russia, Germany, the Levant, Greece, and the French West India colonies; some portion of the shipments to England were re-shipt to India and other parts. Of late years a considerable demand [illegible] has arisen in the United States, and if this demand should increase in the same degree as at present, it is calculated that in four or five years it will be larger than [illegible] Great Britain and her colonies. There is a large [illegible]ption of Champagne in Paris and the principal cities of [illegible]e, [illegible]ch is also drunk in the places of production, [illegible] he[illegible] a population of 36,000, consumes on the average 28,000 hectolitres in the year, being at the rate of 84 bottles for each person. The wine consumed on the spot is chiefly of the inferior qualities, and so great is the disparity in this respect, that in the same commune the produce of the same vintage (1834) sold at prices varying from 150 francs [illegible] francs the hectolitre, while the wine of a neighbo[illegible]une sold for 20 francs the hectolitre—about three halfpence per bottle: these prices were for new wine.

A great deal of care is required in the management of sparkling and creaming wine. The fermentation in the cask ceases in about three months after the vintage, when the wine must be racked from its lees: a dry cold day is chosen for this operation. In a month from that time a second racking is performed and the wine is fined with isinglass; sometimes a third racking precedes the bottling, which takes place in March or April. It is necessary to use great care in rejecting all bottles which are not strong and of uniform thickness. When [illegible] corked, and the corks secured with packthread [illegible], the bottles are placed on the sides in rows piled one above another to the height of six feet. In July or August following, the formation of the carbonic acid gas, to which the effervescence is owing, causes a considerable breakage of the bottles. The loss from this cause varies from 5 to 40 per cent. When the breakage is proceeding most rapidly the workmen wear wire masks in the cellars as a protection from the broken glass, which is projected with considerable force. This breakage continues until the middle of September. In the following month the piles are taken down, the broken bottles taken away, and the sediment which has formed in the whole bottles is removed in the follow[illegible] The bottles are first placed in a sloping posi[illegible] wi[illegible] the necks downward, and are shaken occasionally without taking them up, in order to detach the sediment from the bottl and to cause it to subside into the neck. When this effec has been produced, each bottle is removed, its sloping position being preserved; the wire and twine are taken off an the cork is withdrawn, when the sediment will be driven ou by the carbonic acid gas. Some dexterity is required o the part of the workman to get effectually rid of the sediment without wasting the wine. The bottles are then fille up with bright wine, corked, wired, and binned as before It is often necessary to repeat this process several times before the wine is sent from the cellar, and it [illegible] to be rule with the dealers never to send away wine which has no undergone this operation within a fortnight from the tim of its being dispatched.

The time that has been mentioned is that in which th effervescence usually occurs, but it is sometimes delayed t a later period, and even to he following year. When thi greater time has elapsed, if symptoms of effervescence a not apparent, the wine is mixed in a cask with some ne wine, and treated as before. Still, or non-sparkling wine, i not bottled until the autumn following the year of it vintage.

The losses and expense of labour attendi[illegible] just described add materially to the cost [illegible] wine, so that the price of the first quality delivered fr[illegible]he dealer's cellar is seldom under 3 to 4 francs the bottle; of the second quality 2½ to 3 francs, and the third quality 2 to 2½ francs.

The quantity of land planted with vines in the department of the Marne was stated by the Chamber of Commerce of Rheims, in Sept., 1834, to be 20,600 hectares [illegible] acres), yielding 28 to 30 hectolitres (616 to 660 impe[illegible]lons) of wine for each hectare, or about 255 gallons per acre. Owing to superior cultivation the produce of the [illegible] has much increased during the last 40 years, although [illegible]antity of land planted with vines has been lessened. The productiveness of vineyards is subject to great uncertainty. In some years the average quantity is more than doubled, and in others the produce does not amount to one-fourth of an average vintage. In an official statement of the produce of the vineyards in the department of the Au[illegible] the years 1828 to 1833, the average annual produce is [illegible] 530,609 hectolitres, while, in 1828, the quantity reached 1,036,599 hectolitres, and in 1830 was only 135,[illegible] hectolitres. The value of vineyard land in [illegible] situations in the department of the Marne is very great; it is stated that such spots have been sold as high as 50,000 francs per hectare, equal to 800*l.* per acre; but this is an extreme price, the usual value of land being from 12,000 to 30,000 francs per hectare (from 200*l.* to 480*l.* per acre). The quantity of sparkling wine sent away from [illegible]ent in 1833 is stated by one of the principal merchants of Rheims to have amounted to 2,689,000 bottles, which were distributed thus:—England and British India 467,000; Russia 400,000; Germany, including Prussia and the Austrian dominions, 439,000; United States of America, Canada, and West Indies, 400,000; Poland [illegible]; Italy [illegible],000; Belgium 56,000; Holland 30,0[illegible] and Denmark 30,000; Switzerland 30,000; [illegible] 30,000; Spain and Portugal 20,000; Turkey 5000; and other parts of France 620,000 bottles.

CHAMPAGNE, PHILIPPE DE, was born in Brussels, in 1602. His parents, who were in middling circumstances, indulged his early taste for painting, and he was placed under masters in his native place. At the age of nineteen he went to Paris, with the intention of passing on to Rome, but he was unable to accomplish his journey; probably from the want of means. He received some assistance in his studies from Fouquières, and afterwards became acquainted with Nicholas Poussin, [illegible] that great painter returned from Italy, from whose advice and society he derived great advantage. They painted in company in the Luxembourg. Upon the death of Duchesne, Champagne succeeded to his place as painter to the queen. Richelieu endeavoured to withdraw him from his royal patroness, but Champagne refused his most brilliant offers. He was indeed so scrupulous in his conduct that he never touched a brush on holidays, nor ever painted from the naked figure. He married the daughter of Duchesne, by whom he had a son. He was received into the academy [illegible] on its first formation, in 1648, and was subsequently [illegible]tor. He died in 1674.

Champa[illegible]oured with extreme assiduity, and acquired grea[illegible]ility. His drawing is minutely correct, and his colour p[illegible]g; but his design and effect are tame. His portraits are [illegible] esteemed, particularly one of Richelieu. His principal [illegible]rks are at Paris, where he spent nearly the whole of his life.

Philippe de Champagne, on the death of his wife and son, adopted a nephew, Jean-Baptiste, whom he instructed in painting, but he never attained any distinction.

CHAMPLAIN, a lake of considerable extent situated on the N. boundary of, but almost entirely within, the United States of North America. It derives its name from Samuel de Champlain, a French naval officer, who was governor-general of Canada in the 17th century. It divides, for more than 100 miles, the state of New York from that of Vermont, and its most northern extremity belongs to Lower Canada. It stretches in a direction very nearly from S. to N. from 43° 30′ to 45° 4′, or through 109 miles. As the boundary between the United States and Lower Canada runs along the parallel of 45°, only about 5 miles of its northern extremity belong to Canada. But the lake may fairly be considered as extending still further north in the narrow channel called the river Chambly, or Sorel, as far as the town of St. Jean, in Lower Canada; this will add about 30 miles more to its length. Its area may be between 600 and 700 square miles. Its breadth varies from about half a mile to 20 miles, and its depth is in some places very great. On both sides of the la[illegible] high grounds which rise to a considerable elevat[illegible] Owing to this circumstance the numerous rivers which, from the E. as well as from the W., empty themselves into the lake, though they run from 40 to 60 miles, are only navigable at their mouths; the entire fall in their course being from 500 to 1000 feet. The short river, which issues from Lake George and enters Lake [illegible]n at its southern extremity, is likewise unfit for [illegible]ion on account of its rapids and cataracts. Lake George is nearly 200 feet above Lake Champlain, and Lake Ch[illegible] only 90 feet above the tide-water in the St. Lawrence. This lake is navigated by vessels of considerable size. It discharges its water by the Chambly or Sorel, which leaves it at its most northern extremity and falls into the St. Lawrence near the town of Sorel, or Henry William. The Chambly is navigable for river-barges, and forms the [illegible]frequented line of communication between the United [illegible]es and Lower Canada. Steam-boats ply between Whitehall, at the southern extremity of the lake, and St. John. Among the numerous islands of Lake Champlain, the largest are North and South Hero and Lamotte, belonging to the State of Vermont.

The principal towns on or near the lake, are Plattsburgh, St. Albans, Burlington, and Whitehall. In September, 1814, a naval battle was fought on this lake, near Plattsburgh, in which Commodore Macdonough, the American commander, defeated the British fleet. (Darby; Bouchette.)

CHAMPLAIN CANAL, in the state of New York, commences at Whitehall, at the southern extremity of Lake Champlain, and runs in a general southern course to the Hudson at Fort Edward. From Fort Edward it runs southward along the west side of the river [illegible]ratoga, and joins the Erie at Watervliet above Albany. The whole length of the canal, including about sevent[illegible]les of improved river-navigation, is sixty-four miles. By this canal a water communication is opened between the Hudson and the St. Lawrence through Lake Champlain. It was completed in 1822.

CHAMPOLLION, JEAN FRANÇOIS LE JEUNE, so called to distinguish him from his elder brother, generally called Champollion Figeac, who is the author of several works on antient history and archæology, was born at Figeac, in the department du Lot, in 1790. He studied in the lyceum of Grenoble, and afterwards went to Paris in 1807, where he applied himself to the oriental languages under Langlès and De Sacy, but more especially to the study of the Coptic, and to Egyptian archæology in general. In 1811 he was appointed professor of history in the lyceum of Grenoble, and librarian of the public library. In 1814 he published his first work 'L'Egypte sous les Pharaons,' 2 vols., 8vo.; which is a geographical description of that country under its antient kings, with a view to fix its divisions, the sites and names of its towns, &c. The work is accompanied by a map. In the preface, alluding to the hieroglyphics on the Egyptian monuments, he says, 'that it was to be hoped that from those monuments, on which [illegible] Egypt painted mere material objects, we should be able at last to discover the sounds of its language, and the expression of its thought.' In 1821 he published at Grenoble a little work, 'De l'Ecriture Hiératique des Anciens Egyptiens,' in which he stated his opinion, 'that the hieratic characters were merely a modification of the hieroglyphic symbols, which was adopted for the sake of brevity, and as a sort of hieroglyphic short-hand, and were not alphabetical characters as it had been supposed by some; the hieratic characters, as well as the hieroglyphic from which they are derived, being expressive of objects and not of sounds.'

In the year following appeared Champollion's letter to M. Dacier, the secretary of the academy of inscriptions and belles lettres, 'relative à l'alphabet des hiéroglyphes phonétiques employé par les Egyptiens pour inscrire sur leurs monumens les titres, les noms, et les surnoms des souverains Grecs et Romains,' Paris, 1822. In this letter he retracted what he had formerly asserted, in so far that he now demonstrated what Dr. Young had already stated in November, 1819, in the supplement to the Encyclopædia Britannica, art. 'Egypt,' namely, that the Egyptians used occasionally hieroglyphic signs as alphabetical characters on their monuments, to express the names of foreign sovereigns Greek and Roman, who ruled over their country. In the introduction to his next work, 'Précis du Système Hiéroglyphique, etc.,' Champollion observes, and his friend Rosellini confirms it in his biography, that he came to the same conclusion as Dr. Young contemporaneously with the latter, and by his own investigation; but this assertion, especially with regard to contemporaneousness, is at variance with the statements of the Grenoble work already mentioned, which was published as late as 1821, nearly two years after the publication of Dr. Young's discovery. However this may be, Champollion at least improved upon Dr. Young's hint, and deduced a phonetic alphabet, applicable not only to the names and titles of foreign sovereigns, but also to those of the native sovereigns and of the divinities of antient Egypt. By comparing Champollion's alphabet with Dr. Young's, the difference between the two is apparent. Champollion used the word phonetic to express characters denoting sounds, a term which had been used long before him by Zoega in the same sense in his work on Obelisks. In his 'Précis du Système Hiéroglyphique des Anciens Egyptiens, ou Recherches sur les Elémens premiers de cette Ecriture Sacrée, sur leurs di verses combinaisons et sur les rapports de ce Système avec les autres Méthodes Graphiques Egyptiennes,' Paris, 1824, he asserted, 1. 'That his phonetic alphabet is applicable to all the royal names of the most antient epochs. 2. That the

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in a great measure composed of signs purely alphabetical, and such as are determined in his phonetic alphabet.' It seems almost superfluous to remark that the two last positions are mere assertions, unsupported by proof, as any one who will take the pains to examine attentively Champollion's works will easily see. Klaproth, in his 'Observations Critiques sur l'Alphabet Hiéroglyphique découvert par M. Champollion le Jeune,' which precede his 'Collection d'Antiquités Egyptiennes,' Paris, 1829, has in our opinion completely demolished Champollion's general theory, and reduced his discovery to its proper limits. Klaproth concludes his critical observations with the following corollaries: 1. 'That Champollion appears to have had no fixed basis for his system, as he has repeatedly altered the meaning of his characters, both phonetic and symbolic, as appears from comparing the alphabet of the second edition of his "Précis," 1827, with that of the first. 2. That although he has explained proper names and some particles of speech, yet he has never been able to read satisfactorily one connected sentence of Hieroglyphic writing, nor three or four consecutive words of the demotic characters of the Rosetta stone. 3. That he assumes against all probability that the Coptic language, which is a mixed dialect, and known to us in a very imperfect state, is the language that was spoken by the Egyptians under the Pharaohs; its sounds, according to him, being represented by the phonetic signs. 4. That it appears that the names of the kings and the ordinary epithets attached to them are written alphabetically in the cartouches or frames; but that besides these, every king has another title of honour or prænomen which fills up another cartouche, and which seems composed partly of alphabetic and partly of symbolic characters, which last have hitherto been only explained by conjecture.' Besides these and other general arguments against Champollion's system, for which we refer to Klaproth's work, Klaproth charges Champollion with having completely altered several cartouches of the table of Abydos, to make them suit his hypothesis. And further, he does not forget to remind us that Champollion, while passing through Aix on his way to Egypt in 1828, saw a fine papyrus belonging to Mr. Sallier, written in demotic characters, which he gravely pronounced to be 'a history of the campaigns of Sesostris Ramses, written in the ninth year of that monarch's reign by his bard and friend.' This assertion was published as a great discovery by the academy of sciences of Aix, and the report was inserted in Ferussac's 'Bulletin Universel.'

During Champollion's visit to Turin in 1824, to examine the Egyptian Museum of that city, he wrote two letters to the Duke of Blacas d'Aulps, who had become his patron at the French court. In these letters he explains the names and titles of many of the Pharaohs written upon the monuments in the Turin collection, and he undertakes to class them into dynasties, with the assistance of Manethon. ('Lettre à M. le Duc de Blacas d'Aulps, relatives au Musée Royal Egyptien de Turin,' Paris, 1824-5.) His work on the Egyptian gods came out in parts, but has never been completed: 'Panthéon Egyptien, ou Collection des Personnages Mythologiques de l'ancienne Egypte, d'après les Monumens, avec un texte explicatif.' Charles X., having determined to purchase a valuable collection of Egyptian antiquities, just arrived at Leghorn, for the museum at Paris, Champollion was appointed, through the Duke of Blacas, to proceed to Italy for the purpose of examining and valuing them. From Leghorn he proceeded to Rome and Naples, in the company of Rosellini. On his return to Paris, he was named Director of the Egyptian Museum at the Louvre, of which he published a description, 'Notice descriptive des Monumens Egyptiens du Musée Charles X.,' 1827. In 1828 the King of France appointed a scientific expedition to proceed to Egypt, in order to examine the monuments of that country under Champollion's direction. At the same time the Grand Duke of Tuscany, Leopold II., appointed a similar expedition for the same object, at the head of which he placed Rosellini, Champollion's friend. The two expeditions, consisting of six Frenchmen and six Tuscans, sailed together from Toulon, and arrived at Alexandria in August, 1828. Champollion remained till the end of 1829, during which time he wrote the letters which are published under the title of 'Lettres écrites d'Egypte et de Nubie en 1828-9,' 8vo., Paris, 1833. On his return to France, in 1830, he was made a member of the Institute, and subsequently appointed, by Louis Philippe, Professor of Egyptian Antiquities in the College of France. It was agreed between the French [illegible] Tuscan governments that the result of the observations of the two expeditions should be published together in one work, in French and Italian, under the direction of Champollion and Rosellini, 'Monumens de l'Egypte et de la Nubie, considérés par rapport à l'Histoire, la Religion, et les Usages Civils et Domestiques de l'Ancienne Egypte,' etc. The work began to appear in parts, in 1832. In the letterpress accompanying this publication Rosellini has not only adopted the general system of Champollion, but has carried it much farther than his friend. A sharp criticism upon it by Cataldo Jannelli, was published in No. 19 of the 'Progresso,' a Neapolitan Journal, Naples, 1835. While Champollion was preparing the first part of the new work for the press, he was attacked by a paralytic fit, and died at Paris on the 5th March, 1832.

Champollion's merits, as a laborious student of Egyptian archæology, are undeniable; but his judgment seems not to have been sound, his deductions from his premises not always correct, and his learning (excep [illegible] Egyptian antiquities) neither extensive nor exact. [illegible]e corrected Dr. Young's first rude notions as to the ph[illegible]c symbols, and considerably extended the number of known signs; and this may perhaps lead to further results. Had he lived longer, he might have modified some of his former assertions, and entered perhaps upon a safer path of investigation. For the controversy concerning the general application of the phonetic alphabet, see vol. ii. of the *Egyptian Antiquities* of the British Museum, published in the *Library of Entertaining Knowledge*, ch. x., on the 'Rosetta Stone,' where the subject is fully investigated. See also Professor Kosegarten, *De prisca Ægyptiorum Literatura Commentatio*, 4to., 1828, in which the professor observes that only forty of the demotic or enchorial characters are yet decyphered, which represent five vowels and eleven consonants, while there is a vast number of other signs in the same writing, the value of which is not known, nor is it yet ascertained whether they are phonetic or symbolic; Greppo's *Essay on the Hieroglyphic System of Champollion*, translated by Stuart, Boston, 1830. Rosellini wrote a biographical notice of Champollion in the Florence *Antologia* for April, 1832. Champollion made a Coptic Grammar and Dictionary, which remain yet unpublished.

CHANCE. This word has been used in two senses, as opposed to Providence, and as opposed to Certainty. For the theory of chances, in the latter sense, see PROBABILITIES, THEORY OF.

CHANCE-MEDLEY, in English law, is a singular corruption of chaudemellé, a term well known in old French legal phraseology, and in the barbarous Latin of ancient ordinances translated *calida melleia*. The term in French law denoted, consistently with its etymology, a casual affray or broil, accompanied with violence, but without deliberation or preconceived malice. (Ducange, *Gloss.* ad verbum *Meslie.*) In English law, it can hardly be doubted that Chance-medley originally meant the same thing; but in modern times the expression is limited to a particular kind of homicide, viz. the killing another in self-defence upon a sudden and unpremeditated encounter. There is often much difficulty in distinguishing homicide by chance-medley, which, though an offence by law, is excusable on the ground of self-defence, from the crime of manslaughter. The general distinction is, that if both parties are actually fighting, he who gives the mortal stroke is guilty of manslaughter; but if one of them at first refuses to fight, and on being closely pressed, retreats as far as he can, and at last, in order to avoid his own destruction, kills his antagonist, this is homicide excusable on the ground of self-defence; or, as it is inaccurately called, chance-medley. See Foster's *Crown Law*, pp. 275, 276, and tit. '[illegible].'

CHANCEL. This is rather a term of ordinary discourse than one which would be used by any person who was undertaking to give a scientific description of the several parts of the fabric of a Christian church. As far as we have observed, it is now used to denote that part of a church in which the communion table or altar is placed, with the area before it, in which the congregation assembles when the

Eucharist was administered. This part of a church was often separated from the nave or body of the church by lattice work, *cancelli*, and it was from this circumstance that the term chancel seems to have originated.

In some churches, however, we may have the chancel of a particular family. This is in cases in which some particular family has [illegible] private oratory within the church, which has usually [illegible] also the burial place of the family. These private chapels or chantries are sometimes called chancels, for the same reason that the great choir is sometimes so called; that is, in consequence of being divided from the rest of the church by *cancelli*.

CHANCELLOR (in Latin, *Cancellarius*). The primary meaning of cancellarius is 'qui ad cancellos assistit,' one who is stationed at the lattice-work of a window or a doorway, to introduce visitors, &c. A cancellarius in this sense was no [illegible] than a door-keeper. The emperor Carinus made one [illegible] cancellarii prefect of the city, a promotion which caused great dissatisfaction. (Vopiscus, *Carinus.*) In another sense, cancellarius was a kind of legal scribe, so called also from his position at the cancelli of the courts of law. The cancellarius, under the later emperors, and in the Constantinopolitan court, was a chief scribe or secretary (*ὁ μέγας λογοθέτης*), who was ultimately invested with judicial powers, and a general superintendency over the rest of the officers of the emperor. He was called cancellarius because he sat intra *cancellos* (within the lattice), a screen dividing off a portion of a larger room for the sake of greater privacy; from which circumstance the chancel of a church also acquires its name.

The prelates of the Roman church had likewise an officer so called; in the Church of England, each bishop has a chancellor, to whom are entrusted judicial functions. All the modern nations of Europe had a chancellor, though his powers and duties seem to have varied in each.

In England the chancellor was originally the king's chief secretary, to whom petitions were referred, by whom patents and grants from the crown were approved and completed, and by whom reports upon such matters were, if necessary, made to the king; hence he was sometimes styled Referendarius. This term occurs in a charter of Ethelbert, A.D. 605; and Selden (*Treatise on the Office of Chancellor*) considers it synonymous with chancellor, a name which, he says, first occurs, in the history of England, in the time of Edward the Elder, about A.D. 920.

In the capacity of secretary he was the adviser of his master; prepared and made out his mandates, grants, and charters, and finally (when seals came into use) affixed his seal. Hence, or perhaps because in early times he was usually an ecclesiastic, he became keeper of the king's conscience, examiner of his patents, the officer by whom prerogative [illegible] were prepared, and keeper of the great seal. The last ecclesiastic who exercised the office was John Williams, archbishop of York, who was lord keeper from July 10, 1621, to November 1, 1625; his friend and secretary, John Hacket, who became bishop of Lichfield and Coventry, wrote his life in a volume of singular interest, which he entitled 'Scrinia Reserata.'

The special interference of the king, as the fountain of justice, was frequently sought against the decisions of the courts of law, where they worked injustice; and also in matters which were not cognizable in the ordinary courts, or in which, from the maintenance or protection afforded to his adversary, the petitioner was unable to obtain redress. The jurisdiction with which the chancellor is invested had its origin in a portion of discretionary power, which was retained by the king on the establishment of courts of justice (*Legal Judicature in Chancery stated*, p. 27, *et seq.*). Though the exercise of those powers in modern times is scarcely, if at all, less circumscribed and hemmed in by rule and precedent than the strict jurisdiction of the courts of law [EQUITY], controversies have at times arisen as to the powers of the chancellor: the particulars of one dispute have been preserved to us entire. (*The Jurisdiction of the* [illegible] *Chancery vindicated.* Printed at the end of [illegible] and in the 1st vol. of *Collect. Jurid.*)

[illegible]yle of this officer in England is Lord High Chancellor of Great Britain. He takes rank above all dukes not of the blood royal, and next to the archbishop of Canterbury. He is appointed by the delivery of the great seal into his [illegible] there are instances of his having been a[illegible]t. The resumption of the great seal by the [illegible] his office. By virtue of his office he is the king's principal [illegible] in matters of law and a privy counsellor; speaker and prolocutor of the House of Lords, chief judge in the court of chancery, and the head of the profession of the law; visitor in the king's right of all hospitals and colleges of royal foundation; and patron of all crown livings under the value of [illegible]*l.* a year, according to the valuation made in the reign of Henry VIII., and confirmed in that of Elizabeth. He appoints and removes all justices of the peace, though usually only at the recommendation of lords-lieutenants of counties. He issues writs for summoning parliaments, and transacts all business connected with the [illegible]y and use of the great seal. To him was entrusted the care of infants and their property upon the dissolution of the court of wards and liveries; [illegible] has the jurisdiction over idiots and lunatics by special [illegible]tion from the crown. He also exercises a special [illegible]ons conferred upon him by various statutes, as original and appellate judge, as to charitable uses, friendly societies, infant lunatic and idiot trustees, in certain appeals from the court of review, in bankruptcy, and in many other cases. He is a conservator of the peace, and may award precepts and take recognizances to keep the peace; and has concurrent jurisdiction with the other judges of the superior courts, with respect to writs of habeas corpus. Except in the case of service of process, given to him by some recent statutes, the lord chancellor has no jurisdiction in Scotland.

The authority of lord chancellor and lord keeper are made the same by the stat. 5 Eliz. c. 18: though it is not now customary to appoint a lord keeper. The last lord keeper was Lord Henley, in 1757. The great seal is however sometimes put into commission during the temporary vacancy of the office, or the sickness of the chancellor, the seal being entrusted to the chief commissioner. (1 Will. and M. c. 21.)

The chancellor is not only a judicial officer of the crown, but he has important political functions—he has a seat in the cabinet, and usually takes an active part in public measures. He resigns office with the party to which he is attached. The inconvenience and necessary delay arising from his removal during the pendency of suits in his own court and before the House of Lords, and the arrear of business caused by the variety of duties which he is called upon to perform, have suggested the necessity of some alteration in the constitution of the office. Many expedients have been tried; a vice-chancellor has been appointed; the master of the rolls has been empowered to assist in the usual and ordinary functions of the court of chancery; and a number of useful and important reforms have been made in the subordinate offices of the court. But such is the pressure of business, that all these means have been ineffectual to remedy the inconvenience; and a bill was introduced into the House of Lords, during the present session (1836), by the chancellor, Lord Cottenham, for the purpose of effecting still further alterations. Upon discussion, it did not appear that the measure was sufficiently matured; though, in all probability, some alteration in the office will be speedily effected.

By the 3 and 4 Wm. IV., c. 111, sec. 3, in consideration that the Chancellor had lost the patronage of certain offices then abolished, the king is empowered to grant an annuity of 5000*l.* a year to the Lord Chancellor or Lord Keeper on his resignation of office. There is also a Lord High Chancellor of Ireland, whose authority within his own jurisdiction is in most respects the same as that of the Lord High Chancellor of Great Britain. (Selden, *Off. Ch.*; Black. *Com.*; Story *on Equity*; and the *Books of Chancery Practice.*)

The *Chancellor of a Church or of a Bishop* is Vicar-general to the bishop, holds his courts, and directs and assists him in matters of ecclesiastical law. He has a freehold in his office, and he is not necessarily an ecclesiastic; but if he is a layman, or married, he must be a Doctor of the Civil Law. (Black. *Com.*; 37 H. VIII., c. [illegible].)

The *Chancellor of a Cathedral* is an officer who superintends the regularity of the religious services.

The *Chancellor of the Duchy of Lancaster* presides either in person or by deputy in the court of the Duchy of Lancaster concerning all matters of equity relating to lands holden of the king in right of the Duchy of Lancaster. The court is holden in Westminster Hall, and was formerly much used; at present it is rarely employed.

The *Chancellors of the Universities of Oxford and Cambridge* a[illegible]ted by the respective corporate bodies of which they are [illegible]eads; they exercise exclusive jurisdiction in all civil actions and suits where a member of the University privileged person is one of the parties, except in cases where the right to freehold is concerned. In both the English Universities the duties of the Chancellor are in nearly all cases discharged by a Vice-Chancellor.

The *Chancellor of the Exchequer* is under-treasurer, and holds the seal of the Exchequer. The office of Lord High Treasurer is now executed by the Lords Commissioners of the Treasury. The Chancellor of the Exchequer is the principal finance minister of the crown; the office is generally held by the Prime Minister when he is a member of the House of Commons. The legal functions of the Chancellor of the Exchequer are now merely formal. Bills in the Exchequer are addressed to him, and to the barons of that court, and on some occasions (as on his appointment) he sits in court; but all the legal business is transacted by the barons. If the chief baron and barons are equally divided in opinion, the Chancellor of the Exchequer may be required to re-hear the cause with the barons, and give his decision. The last instance occurred in 1735, when Sir Robert Walpole gave his decision upon a question of considerable doubt and difficulty, which is said to have given great satisfaction. (Bl. *Com.*; Fowler's *Exchequer Practice.*)

The *Chancellor of the Order of the Garter* and other orders of knighthood seals and authenticates the formal instruments of the chapter, and keeps the register of the order. He exercises various functions at the installation of the knights, and during their meetings and processions.

CHANCELLOR OF SCOTLAND. As in England, the chancellor of Scotland was always a high officer of the crown, and had great influence with the king and authority in his councils. As in England too, that authority at length extended itself beyond its former limits, and affected the whole judicial power of the kingdom. Its operation and effect in the two countries, however, was different: for while in England the chancellor only carved out for himself a jurisdiction in equity, in Scotland he reached the head of the administration of justice, and sat in a court which dispensed both equity and common law, and the course of proceeding in which all the other judicatures of the realm were bound to follow.

In 1425, which was shortly after the return of King James I. from his long captivity in England, the 'chancellor and with him certaine discreete persones of the thre estates chosen and depute by the king' were erected into the court of the session, for the final determination of all matters competent to the king and his council. The court of the session however expired with Bishop Wardlaw, from whom in all likelihood it originated; the chancellor's office being taken, on his death, from his protegé, Bishop Cameron, and given to Sir William Crichton, a layman, when the former policy of determining suits by the old common law was restored. This continued (with the exception of an attempt to the contrary in 1457, probably under the influence of Bishop Shorsewood, the favourite and confessor of King James II.) till the time of Bishop Elphinstone, to whom undoubtedly may be ascribed the crafty acts passed in 1487 for the recovery of the large jurisdiction of the chancellor and court of the session, as well as the act 1494, c. 5, to enforce in the courts the study and practice of the canon and civil laws. Nor perhaps shall we greatly err in conceiving his zeal to have been employed in establishing in 1503 the court of daily council, which was essentially a restoration of the old court of the session. But all these proved only preparatory steps to the erection of the court of council and session, or college of justice, which was instituted in 1532, and has continued to our own time. Of this college the chancellor, or, as he then began to be styled, lord chancellor of Scotland, was to be principal; and as on the one hand it was the supreme court of the kingdom, and on the other all inferior courts were required to copy its proceedings, it wielded the whole judicative power of the country. It early claimed also, and exercised, a large legislative power under the statutes permitting it to pass acts of sederunt; and the officers who executed its warrants and decrees were either its own macers or else messengers, over whom it obtained complete control. These powers the court wielded so as to effect nearly an entire change of the law. The ecclesiastical estate for some time predominated both on the bench and at the bar. The consequence was, the canon and civil laws became, what indeed they used to be styled, the common law of the land, and the old common law became obsolete and antiquated. Much of this has been corrected since the Reformation; and still more since the union with England, where [illegible] old common law has ever continued the antagonist of [illegible] n jurisprudence. At the Reformation the authority of [illegible] canon law ceased, and not long afterwards ministers of [illegible] e gospel were disabled by statute from being either of [illegible] ch or bar. The authority of the canon law was in like manner essentially broken by the Union, when both portions of the island became one great mercantile communi[illegible] which the civil law was in many respects unsuitable; and since that event various provisions have been made to improve and assimilate the laws and practice of the two kingdoms.

The similarity of procedure in the court of session in Scotland and the high court of chancery in England is striking. Both courts indeed, and the ecclesiastical courts of both countries, borrowed their forms from the court of Rome, and with these last the forms of the court of session in many respects still agree. The bill or written supplication to the court for letters, whether of summons or of diligence, is of the same nature with the supplication for letters in the court of Rome; and it is observable that when the desire of the bill is granted, it is in the same terms in both courts. The condescendence and answers are plainly derived from the articuli and responsiones of the papal tribunal. The initialia testimonii, or purging of a witness, are identical with the interrogatoria generalia of that court. Letters of advocation, suspension, and reduction, are well known there. The 'malè appellatum et benè processum' is but verbally translated in the phrase of the Scots court, 'Finds the letters orderly proceeded;' and letters of horning, caption, and relaxation, bear their papal origin impressed upon them. It appears also that from an early period the court issued commissions to its macers to perform judicial duties, as the ecclesiastics appoint the inferior church officers their legates and commissaries for the like purposes: and at an early time also the judges began the yet subsisting custom of changing their name on their elevation to the bench, in imitation, as it seems, of the like custom on elevation in the papal hierarchy.

From what is above stated, we may see why there is no court of chancery in Scotland, separate from the courts of common law, as in England; the whole judicatures of Scotland having become subject to the court of session, where the chancellor presided, dispensing both equity and common law. But from the earliest times there was an office of chancery in Scotland, and we shall find that many of the early chancellors had been 'clerici cancellarii.'

A list of the chancellors as of the other great officers of the crown in early times, is of considerable importance, particularly in settling the dates of early charters. The series of chancellors given in Crawford's 'Officers of State' is very imperfect; and in the subsequent list of Chalmers (*Caled.*) there are also various errors and deficiencies. A more correct list than any we have yet met with is therefore subjoined. In Beatson's 'Political Index' there is a chancellor so early as the reign of Malcolm III., but the more authentic series begins with

Constantine, earl of Fife, who is C. temp. Alex. I.
Herbert, abbot of Selkirk, temp. Alex. I. and Dav. I.
Edward, temp. Dav. I.
John, bishop of Glasgow.
William Cumyn, previously clerk to Chancellor Godefrey of England, 1133—1142.
Jordan, clericus regis, 1142—3.
Edward, 1143.
Walter is said by Chalmers to have been C. from 1146 to 1160, but he is in office about the year 1144. (Lol. *Col.*, vol. i., p. 38: Dugdale, *Monast.*, vol. i., p. [illegible].)
Patrick, Bishop of Brechin, was C. temp. Dav. I., and that see was founded circa 1150.
Ingelram, archdeacon of Glasgow, is said by Chalmers to have been C. from 1160 to 1164; but he was in office in 1151, and was continued by King Malcolm. (Keith's *Bishops.*)
Walter is again C., 7 Malc. IV.
Edward, 1163 (Keith's *Bishops*, edit. Russel, p[illegible]
Nicolas, cler. regis, 1165—1171.
Walter de Bidun, cler. regis, 1171—1178.
Roger, 1178—1189.
Hugh de Roxburgh, archdeacon of St. Andrews, 1189—1199.
William de Malvoisine, bishop of Glasgow, [illegible]. (Keith's *Bishops.*)
Florence, made C. according to Chalmers in 1200, ac-

cording to Crawford in 1202, and according to Keith in 1208.

William de Boscho, bishop of Dunblane, 1211.

Thomas de Strivelin, archdeacon of Glasgow, 1226—7.

Matthew Scot, archdeacon of St. Andrews, 1227.

William de Lindsay, [illegible].

William de Bondington, archdeacon of St. Andrews, 1231.

Robert, abbot of Dunfermline, 1249.

Gameline, archdeacon of St. Andrews, 1250—1256.

Richard, bishop of Dunkeld, 1256 (Fordun).

William Wischart, archdeacon of St. Andrews, 1256—1273.

Robert, abbot of Dunfermline, 1273.

William Fraser, dean of Glasgow, 1273—1280.

Sir Thomas de Carnotto, or Charteris, 1280—1285.

Alan St. Edmunds, bishop of Caithness, 1291. He was made C. by King Edward I. of England, who also associated in office with him Walter de Agmodescham (Ayloff's *Cal.* 105), and thereafter Adam de Bodingdon, who is V.C. 1291* (Rotul. *Scot.*, 9), and C. in December the same year, the bishop of Caithness having previously died.

Alan de Dunfres, parson of Dumbarton, 1292 (Rot. *Scot.* 13).

Alexander Kennedy, 1296.

Walter de Agmodescham, 1296.

Maurice, bishop of the isles, 1298.

Nicolas de Balmyle, parson of Calder, 1301. In 1307 he was put into the see of Dunblane, and then perhaps resigned, for

William de Bevercotes is C. about that time.

Bernard de Linton, abbot of Arbroath, 1315.

Walter de Twynham, canon of Glasgow, 1327.

William Brisbane, 1332.

Sir Thomas de Carnotto, 1342—1346.

William de Caldwell, prebendary of Glasgow, 1349.

Patrick de Lenchars, bishop of Brechin, is C. 29 Dav. II., and onwards to the reign of Rob. II.; yet Adam, bishop of the same see, is in office 31 Dav. II. (Keith's *Bishops*, edit. Russel, p. 565).

John de Carrick, canon of Glasgow, 1370.

John de Peebles, canon of Glasgow, 1377, and *semble* onwards to 20 Rob. II. (Keith's *Bishops*, edit. Russel, p. 85); but in his absence abroad, Adam Forrester of Crostorphine was keeper of the great seal, 19 Rob. II.; and from about 1389 to the end of 1395 Alexander Cockburn of Langton was keeper.

Duncan Petit, archdeacon of Glasgow, 1395.

Gilbert Greenlaw, bishop of Aberdeen, 1396 to 1423; in which last year he was abroad, and Sir John Forrester of Crostorphine was keeper.

William Lauder, bishop of Glasgow, 1423.

John Cameron, bishop of Glasgow, 1426.

Sir William Crichton, 1440.

James Kennedy, bishop of St. Andrews, 1444.

James Bruce, bishop of Dunkeld.

Sir William Crichton again, 1447.

George, bishop of Brechin, April 19, 1448 (Keith's *Bishops*, edit. Russel, p. 566).

William, earl of Orkney, 1455.

George Shoresewood, bishop of Aberdeen, 1458.

Andrew, Lord Avendale, 1460.

John, bishop of Brechin, September 6, 1480 (Keith's *Bishops*, edit. Russel, p. 566).

John Laing, bishop of Glasgow, 1482.

James Livingston, bishop of Dunkeld, 1483.

Colin, earl of Argyll, 1483.

William Elphinstone, bishop of Aberdeen, 1488.

Colin, earl of Argyll again, 1488.

Archibald, earl of Angus, 1493.

George, earl of Huntley, 1498.

James, duke of Ross, archbishop of St. Andrews, 1502.

Andrew Foreman, bishop of Moray, 1506.

Alexander, bishop of St. Andrews, 1511 (Keith's *Bishops*, edit. Russel, p. 34).

James Beaton, abbot of Dunfermline, 1513. In 1525, on the removal of the duke of Albany from the regency, the earl of Angus turned Beaton, now bishop of St. Andrews, out of the chancellorate, which, with several other offices, he then engrossed to himself. On Angus's fall, the place was given, in 1528, to Gavin Dunbar, archbishop of Glasgow, in whose time the college of justice was instituted. The series of chancellors need not be further continued. By art. 24 of the treaty of Union, it was provided that there should in future be but one great seal for the United Kingdom, and that a seal should be kept and used in Scotland for such private rights or grants as had usually passed the great seal of Scotland. The office of chancellor of Scotland then properly expired, and none have been appointed to it since the earl of Seafield, who was chancellor at the time of the Union.

CHANCERY (*Cancellaria*); the term is derived from Chancellor, *Cancellarius*, and signifies the court where that judge exercises his functions. There are several chanceries, as there are several chancellors; but the place where the Lord High Chancellor's judicial functions are exercised is especially called the Chancery.

The principal part of the business of the Court of Chancery consists in the administration of *equity*, a name which in this country comprehends a particular set of rules, having the force of law, which are applicable to such matters as belong to the jurisdiction of the court. The Court of Exchequer, and within certain small districts various local courts also have a similar jurisdiction. For a particular account of the procedure in Courts of Equity, and a history of the origin of that jurisdiction, see EQUITY.

The Lord Chancellor, the Vice-Chancellor, and the Master of the Rolls are the judges by whom equity is administered in Chancery. Each of these has a separate court. These courts have no fixed or permanent situation. In term they are held in Westminster Hall; in Vacation, the first two in Lincoln's Inn, and the last at the Rolls, in Chancery-lane.

The Court of Chancery is a name which, it seems, properly belongs to the Lord Chancellor's Court and the Vice-Chancellor's Court together; it is sometimes applied to the former alone, but most frequently to all the three courts together. The proper presiding judge in the Lord Chancellor's Court is the Lord High Chancellor himself.

The Master of the Rolls is appointed by the crown, by letters patent, and holds his office for life. He administers equity in a separate court, called the Rolls. He has the power of hearing and determining originally the same matters as the Lord Chancellor, excepting cases in lunacy and bankruptcy; but all orders and decrees pronounced by the Master of the Rolls must be signed by the Lord Chancellor before they are enrolled. The Master of the Rolls has precedence next to the Lord Chief Justice of the King's Bench. This office is one of high antiquity. The salary is reckoned about 7000*l.* a year.

The office of Vice-Chancellor was created by stat. 53 Geo. III. c. 24. This officer (who takes precedence next to the Master of the Rolls) is appointed by the crown by letters patent, and holds his office during good behaviour. He has power to hear and determine all matters depending in the Court of Chancery either as a court of law or as a court equity, or as incident to any ministerial office of the court, or which are subjected to the jurisdiction of such court or of the Lord Chancellor by any special Act of Parliament, as the Lord Chancellor shall from time to time direct. But all orders and decrees of the Vice-Chancellor must be signed by the Lord Chancellor, and the Vice-Chancellor has no power to alter or discharge any decree or [illegible] made by the Lord Chancellor, unless authorised by the Lord Chancellor, nor any power to alter or discharge any order or decree of the Master of the Rolls. The salary is 5000*l.* a year.

Each of these judges has nearly an equal share of *original* power to dispense equity. An appeal (which, strictly speaking, is nothing more than a re-hearing of the cause) may be made from any decision of the Master of the Rolls or Vice-Chancellor to the Lord Chancellor, and the court of the latter has been of late years principally occupied with such appeals, original causes being generally confined to the Courts of the Master of the Rolls and the Vice-Chancellor.*

Besides the judges just mentioned, there are other officers of the Court of Chancery by whom certain parts of the equitable jurisdiction are exercised. These officers have however no original power for this purpose, but derive all their authority from special delegation by one of the three judges in Chancery. The principal of these officers are the Masters in Ordinary, and the Accountant-General. The Masters in Ordinary are ten in number, besides the Master of the Rolls, who is the chief of them. They were formerly appointed by the Lord Chancellor, but are now appointed by the crown, and hold office *quamdiu bene se gesserint.* (Stat. 3 & 4 Wm. IV. c. 94.) Their salary is 2500*l.* a year. It is the duty of the Masters to execute the orders of the court upon references made to them, whether in exercise of its original jurisdiction, or under the authority of an act of parliament, and by reports in writing, to show how they have executed such orders. It would be impossible to specify every head of reference to the Masters, because they are almost as numerous as the subjects of the court's jurisdiction. The principal subjects of reference are, to examine into any alleged impertinence contained in pleadings, and into the sufficiency of a defendant's answer; to examine into the regularity of proceedings taken in any cause, or into alleged contempts of court; to take the accounts of executors, administrators, and trustees, or between any parties whatsoever; to inquire into, and decide upon, the claims of creditors, legatees, and next of kin; to sell estates, and to approve of the investment of trust-money in the purchase of estates, and, for this purpose (or for any other, as the case may be), to investigate titles, and settle conveyances; to appoint guardians for infants, and to allow proper sums for their maintenance and education; to tax the costs of the proceedings in any suit, or under the orders of the court; and generally to inquire into and inform the conscience of the equity judge upon all matters of fact, which are either disputed between the parties, or not so far ascertained by evidence as to preclude all doubt on the subject.

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* Hodl[illegible] had half a mark a day for his salary (Ayloff's Cal. 107). In 1309 the salary of the chancellor was 13*l.* 6*s.* 8*d.*

The *Accountant-General* is an officer created by the stat. 12 G. I. c. 32, which also regulates his duties. All money and effects belonging to suitors of the court (which are the subject of a suit), are deposited in the name of the Accountant-General with the Bank of England, which has the general custody of such money and effects, as the banker of the court, subject to its orders. It is the duty of this officer to keep an account with the Bank according to the several causes and accounts to which such money and effects severally belong.

Besides the jurisdiction, of which a sketch has been given above, a summary jurisdiction, upon petition only, without bill and answer, has been given to Courts of Equity in certain cases by acts of parliament. The principal cases in which this summary jurisdiction has been granted are those where trustees or mortgagees die without heirs or leaving infant heirs, or where trustees are out of the jurisdiction, or refuse to convey property to the persons beneficially entitled to it. In these, and many similar cases (which it is unnecessary to mention at large), the court is empowered, upon petition of the parties beneficially interested, to direct a conveyance or assignment of the property held in trust or on mortgage by the infant, or in case of a trustee having died without heirs, or being out of the jurisdiction of the court, or refusing to convey, to appoint some other person to convey in his place. The principal statutes relating to this branch of the jurisdiction of the court are, 1 Wm. IV. c. 47, 1 Wm. IV. c. 60, 1 Wm. IV. c. 65, 4 and 5 Wm. IV. c. 23, 5 and 6 Wm. IV. c. 17.

The stat. 52 G. III. c. 101 gives the court (and the court of Exchequer) a summary jurisdiction in cases of abuse of charitable trusts. The court also exercises a jurisdiction of appointing guardians for infants upon petition merely.

The jurisdiction exercised in Chancery over *infants* and *charities* is partly derived from the general equity jurisdiction, and partly from acts of parliament. (As to the origin of the jurisdiction over infants, see Coke upon Litt., by Hargrave, 88 b. n. 16; 2 Fonbl. *on Eq.*, p. 226, 232).

The jurisdiction over infants is exercised principally in directing *maintenance* to be given them out of the property which they will enjoy on attaining their full age; in appointing and controlling *guardians* of them; and in providing suitable *marriages* for them. It is shared by the three Chancery judges; and the working of it is assisted by the ministration of the masters and other officers of the Chancery.

The same observations apply to the jurisdiction over charities, which amounts to a general superintendence of them, limited however in many cases by the special terms of the charters or acts of parliament by which they are regulated.

A distinct part of the business in Chancery, though but a small part, arises from what is called *the common law jurisdiction of the Court of Chancery.*

It has chiefly respect to actions by or against any officer or minister of the Chancery, and to judicial proceedings respecting the acts of the king, when complained of by a subject. 3 Bl. *Com.* 48.

In actions depending in the Court of Chancery by virtue of its common law jurisdiction, the court has no power to try issues of fact. For this purpose the record of the pleadings must be delivered to the Court of King's Bench, and that court will have the issues tried by jury, and give judgment in the actions; and, from a judgment on demurrer in this court, it is said that a writ of error lies to the Court of King's Bench. See 3 Bl. 49

To the common law jurisdiction of the Court of Chancery belongs the power of issuing certain *writs*; particularly the writ of *habeas corpus*, and the writs of *certiorari* and *prohibition*, for restraining inferior courts of justice from assuming unlawful authority. See 1 Madd. *Chanc.* 17, &c.

This jurisdiction may be exercised by the Vice-Chancellor as well as the Chancellor, but not by the Master of the Rolls. 1 Madd. *Chanc.* 22.

The place where the common law jurisdiction of the Court of Chancery is exercised is the *petty bag office*; which is kept solely for this purpose. No part of the equity business of the Court of Chancery is carried on there.

The Court of Chancery, in respect of its common law jurisdiction, is said to be a court *of record*, which, as a court of equity, it is not. Spelm. *Gloss.* 3 Bl. Com. 24.

'In this ordinary or legal court,' says Blackstone (vol. iii. 49), 'is kept the *officina justitiæ*, out of which all original writs that pass the great seal, all letters patent, and all commissions of charitable uses, bankruptcy, sewers, idiotcy, lunacy, and the like do issue.' The issuing of original writs however is now unfrequent. These writs, which were formerly the foundation of all actions in the courts of law at Westminster, have, with few exceptions, been abolished by recent statutes. Commissions of bankruptcy also are now never issued, owing to the late alterations in the bankrupt law. [Bankrupt.]

In imitation of the High Court of Chancery in England, various local courts of equity have sprung up in the British dominions and dependencies. Some of these are called Courts of Chancery, and therefore are here noticed. In each of the counties palatine of Lancaster and Durham, and in Ireland, there is a court so named, which dispenses the same equity within the limits of its jurisdiction, as the High Court of Chancery. In the Irish Court of Chancery the Lord Chancellor for Ireland presides. From these courts the appeal is immediately to the House of Lords.

In most of our colonies there are Courts of Chancery (Howard's *Laws of the Colonies*). The equity administered in these however appears not to be the settled system which exists in this country, since the governors of the colonies preside in them. From the colonial courts an appeal now lies to 'the judicial committee of the Privy Council.' Stat. 2 and 3 W. IV., c. 92.

Many of the states of North America have their courts of Chancery; but the equitable jurisdiction of some of these are, it seems, more discretionary than that of our own Courts of Equity. In others of the states the Courts of Equity which formerly existed have been abolished. (See Parkes's *Statutes and Orders of the Court of Chancery of the State of New York, &c.*; *An Essay on Equity in Pennsylvania*; by A. Laussat, jun.; and 6 *Law Mag.*, 127.)

CHANCERY, INNS OF. [Inn.]

CHANDLER, DR. RICHARD, was born at Elson in Hampshire, in 1738, studied at Winchester School, and afterwards entered Queen's College, Oxford, in May, 1755. Soon after he took his bachelor's degree in 1759 he published 'Elegiaca Græca,' containing the fragments of Tyrtæus, Simonides, Meleager, Alcæus, &c., with notes. In 1763, he edited the splendid work 'Marmora Oxoniensia.' [Arundel Marbles.] In 1764 he was sent by the Dilettanti Society to travel into Asia Minor and Greece pany with Revett the architect, and Pars the pain spent more than a year in Asia Minor; and, in 1 proceeded to Athens, and passed another year in ex Attica and the Peloponnesus. They returned to Englan in November, 1766. The result of their labours, the 'Ionian Antiquities, or Ruins of Magnificent and Famous Buildings in Ionia,' 2 vols. fol., was published in London in 1769. In 1774, Chandler published 'Inscriptiones Antiquæ pleræque nondum editæ in Asia Minore et Græcia, præsertim Athenis collectæ, fol., Oxford. His 'Travels in Asia Minor,' 4to., 1775, and 'Travels in Greece,' 4to., 1776, still rank among the best descriptions of those countries. There is a French translation (Paris, 1806) of the Travels in Asia Minor and in Greece, with notes, by J. P. Servois and Barbié du Bocage. These two works have been since republished together, by the Rev. R. Churton, with Revett's remarks, and a biography of I Chandler, 2 vols., 8vo., 1825. In 1773 Chandler took t degree of D.D.; and in 1779 he obtained the living of East Worldham and West Tisted, Hants. In 1785 he married, and afterwards travelled in Switzerland and Italy. In 1800, he was made rector of Tylehurst in Berkshire, when he published his 'History of Ilium, or Troy, including the adjacent country and the opposite coast of the Chersonesus,' 4to., London, 1802, in which he refuted Bryant's assertion, 'that the Trojan war was a fiction, and that no such a city as Troy in Phrygia ever existed;' and he vindicated the veracity of Homer, and especially the truth of his local descriptions. Dr. Chandler died in February, 1810, in his seventy-second year. He left in MS., 'the Life of William Waynflete, Bishop of Winchester, Lord High Chancellor of England in the reign of Henry VI., and Founder of Magdalen College,' which was published 8vo., London, 1811.

CHANTILLY, a small town in the department of Oise, on the road from Paris to Amiens, 23 miles from Paris. The houses of this little town are neatly built, and roofed with slate. A handsome street was built by the last Prince de Condé, as well as a richly-endowed hospital, a model for institutions of that kind. The population of Chantilly in 1832 was 2524. Chantilly is the centre of a considerable manufacture of lace, a branch of industry introduced here about the year 1750. There are a large establishment for spinning cotton yarn and manufacturing cotton prints, in which 500 or 600 work-people are employed, and a porcelain manufactory. At one entrance to the town is an hydraulic machine to supply the hospital and the public fountain.

Chantilly existed as a village, with its château, as early as the year 900. It belonged formerly to the families of Orgemont and Montmorenci, but owes its prosperity chiefly to the illustrious family of Condé, to which it belonged from the time of Louis XIII. At the massacre of St. Bartholomew it belonged to the family of Montmorenci; and the remains of the great Coligny, who was connected with that family, having been taken down secretly by some of his servants from the gibbet of Montfaucon, where they had been exposed, were transported to Chantilly and deposited in the chapel of the château, from whence they were afterwards removed to the parish church. By a singular error of the peasantry, the women of the neighbourhood resort to this tomb to make their offerings to 'St. Gaspard de Coligny' for the cure of their diseased children, thus transforming a Huguenot martyr into a Catholic saint. It was to Chantilly that the great Condé (so called) retired when the gout had incapacitated him for the fatigues of warfare, and where Molière, Racine, and Boileau came to amuse his leisure hours. The old château was pulled down and a new one erected by the Duke of Bourbon, about the end of 1718. This edifice was one of the most splendid residences in Europe, and its attractions were increased by the domain, the vast park (planted and laid out in alleys, and surrounded by a wall), the gardens, the menagerie, &c., attached to it. The revolution ruined Chantilly, or nearly so; the château itself was destroyed, but some of the out-buildings remain, as the smaller château, the palace of Enghien, the dog-kennels, and the stables, which, by their size and their architecture, are almost entitled to be termed palaces.

CHANTRY (Cantária, in the middle age Latin), a private religious foundation of which there were many in England before the Reformation established for the [illegible] of keeping up a perpetual succession of prayers [illegible] prosperity of some particular family while living, and the repose of the souls of those members of it who were deceased, but especially of the founder and other persons specifically named by him in the instrument of foundation.

Chantries owed their origin to the opinion so generally prevalent in the Christian church of the efficacy of prayer in respect of the dead as well as the living. Amongst the English, always a devout people, it prevailed in all ranks of [illegible] inscriptions upon the grave-stones of persons [illegible] in the times before the Reformation almost always began with 'Orate pro animâ,' which was an appeal to those who resorted to the churches to remember in those their serious hours to pray for the soul of the person who slept below. Princes and persons of great wealth, when they founded monasteries, included, amongst the duties of the religious for whose use they gave them, that they should receive in them their earthly remains, and for ever make mention of them in their daily services. When the taste for founding monasteries declined, which may be referred to about the close of the twelfth century, the disposition to secure the same object, by the foundation of chantries, began to prevail extensively in the better classes of society, and it continued with unabated zeal to the very eve of the Reformation, when all such foundations were swept away as superstitious.

A chantry did not necessarily require that any edifice should be erected for it. Chantries were usually founded in churches already existing; sometimes the churches of the monasteries, sometimes the great cathedral or conventual churches, but very frequently the common parish church, whether in a town or in a rural district. All that was wanted was an altar with a little area before it and a few appendages; and places were easily found in churches of even small dimensions in which such an altar could be raised without interfering inconveniently with the more public and general purposes for which the churches were erected. An attentive observation of the fabric of the parish churches of England will often detect where these chantries have been, in some small remains perhaps of the altar, which was removed at the Reformation, but more frequently in one of those ornamented niches called piscinas, which were always placed in proximity with the altars. Sometimes there are remains of painted glass which it is easy to see has once been the ornament of one of these private foundations, and more frequently one of those arched recesses in the wall which are called Founders' Tombs, and which in many instances no doubt were actually the tombs of persons to whose memory chantries had been instituted.

In churches which consisted of only nave and chancel with side aisles, the eastern extremities of the north and south aisles were often seized upon for the purpose of these foundations; in the larger churches, having the platform resembling the cross on which the Saviour suffered, the transverse beams were generally devoted to the purpose of these private foundations. In the great conventual churches and the churches of monasteries, it would appear as if provision were often made for these private chantries in the original construction, each window that looks eastward being often made to light a small apartment just sufficient to contain an altar and a little space for the officiating priest.

It was by no means unusual to have four, five, or six different chantries in a common parish church; while, in the great churches, such as old St. Paul's in London, the Minster at York, and other ecclesiastical edifices of that class, there were at the time of the Reformation thirty, forty, or fifty such foundations. When the fabric of a church afforded of tself no more space for the introduction of chantries, it was usual for the founders to attach little chapels to the edifice. t is these chantry chapels, the use and occasion of which are now so generally forgotten, which occasion so much of the rregularity of design which is apparent in the parish churches of England. Erected also as they generally were n the style of architecture which prevailed at the time, and not in accommodation to the style in which the original fabric was built, they are a principal cause of that want of congruity which is perceived in the architecture of different parts of the parish churches.

When chapels were erected for the especial purpose of the chantries, they were usually also the places of interment of the founder and his family, whence we sometimes find such chapels belonging, even to this day, to particular families, and adorned with monuments of many generations. One of the most beautiful chapels of this kind is in the little village of Sandal, a few miles from Doncaster, the foundation of Rokeby, archbishop of Dublin, who died in 1521. The church of Sandal being small afforded no scope for the design of this magnificent prelate. Having therefore determined that here should be the place of his interment and the perpetual celebrations in his memory, he erected a chap [illegible] the north side of the choir, open however to the church on one side, being separated from it only by open wainscot. On entering it by the door one sees at once the whole economy of one of these chapels. Under the window looking eastward an altar has stood; the piscina on the right remains. On each side of the east window is a niche where once, no doubt, stood an effigies of a saint whom the archbishop held in peculiar honour. In the centre is a brass indicating the spot in which the body of the prelate lies; and in the north wall is a memorial of him, having his arms and effigies with an inscription setting forth his name and rank and the day of his decease, with divers holy ejaculations. The stone and wood-work have been wrought with exquisite care, and the windows appear to have been all of painted glass.

Sometimes chantries were established in edifices remote from any church, a chapel being erected for the express purpose.

In chantries of royal foundation, or in chantries founded by the more eminent prelates or barons, the service was conducted sometimes by more than one person. But usually there was but one officiating priest. The foundation deeds generally contain a distinct specification of his duties, which consisted for the most part in the repetition of certain masses; but sometimes the instruction of youth and the delivering pious discourses to the people made part of the duty of the chantry-priests. They also contain an account of the land settled by the founder for the support of the priest. The names of the persons whom he was especially to name in his services are set forth, as well as the mode of his appointment and the circumstances in which he might be removed. Generally the king was named together with the founder and members of his family. This, it was supposed, gave an additional chance of the foundation being perpetuated. The king's licence was generally obtained for the foundation.

In many towns and country places there are antient houses known by the name of chantry houses, or sometimes chantries, or colleges. These have been places of residence of the chantry priests, and when called colleges, where they lived, a considerable number of them being in one church, a kind of collegiate life, it being held that the clergy should mix but little with the laity. These, as well as all other property given for the support of the chantry priests, were seized by the crown and sold to private persons, when by an act passed in the first year of King Edward VI., cap. 14, all foundations of this kind were absolutely suppressed and their revenues given to the king. An account had been taken a few years before of all the property which was settled to these uses, by the commissioners under the act 26 Hen. VIII., cap. 2, whose returns form that most important ecclesiastical document the 'Valor Ecclesiasticus' of King Henry VIII. The 'Valor' has been published by the commissioners on the 'Public Records' in five volumes folio.

CHAPEL, in Latin *capella*, a word common to many of the languages of modern Europe, and used to designate an edifice of the lower rank appropriated to religious worship. Its origin and etymology are very obscure.

In England it has been used to designate minor religious edifices founded under very different circumstances, and for different objects.

1. We have a great number of rural ecclesiastical edifices, especially in the north of England, where the parishes are large, which are not, properly speaking, churches, *ecclesiæ*, though in common parlance they are sometimes so called, but are chapels, and not unfrequently called parochial chapels. Most of these are of antient foundation, but still not so antient as the time when the parochial distribution of England was regarded as complete, and the right to tithe and offerings determined to belong to the rector of some particular church. In the large parishes it frequently occurred that a family of rank which resided at an inconvenient distance from the parish church would desire to have an edifice near to them, to which they and their tenants could resort for the enjoyment of the benefit of Christian ordinances. On reasonable cause being shown, the bishop would often yield to applications of this kind; but in such cases he would not suffer the rights of the parish church to be infringed; no tithe was to be subtracted from it and given to the newly erected foundation, nor was that foundation to be accounted in rank equal to the older church, or its incumbent otherwise than an inferior and subordinate minister to the incumbent of the parish church. But the bishop generally, perhaps always, stipulated that there should be an endowment by the founder of such an edifice. Not unfrequently in edifices of this class there was the double purpose of obtaining a place of easier resort for religious worship and ordinances, and a place in which perpetual prayers might be offered for the family of the founder. [CHANTRY.] Others of these rural chapels were founded by the devotion of the parishioners. The population of a village, which was remote from the church of the parish within whose limits it was included, would increase, and thus the public inconvenience of having to resort to the parish church on occasion of christenings, churchings, marriages, and funerals, besides the services on the festivals, became great; they would therefore apply to the bishop in petitions, many of which are to be found in the registers of the sees, setting forth the distance at which they lived, the impediments, constant or occasional, in the way of their ready resort to their parish church, as want of good roads, snow, the rising of waters, and the like, on which the ordinary would grant them the leave which they desired, reserving, however, as seems almost always to have been the case, whatever rights and emoluments had heretofore belonged to the parish church. In the parish of Halifax there are twelve of these chapels, all founded before the Reformation. In the parish of Manchester, and in most of the parishes of Lancashire, such subsidiary foundations exist in great number. Those foundations of this class which could be brought within the description of superstitious foundations were dissolved by the Act of 1 Edward VI. for the suppression of chantries; but while the endowment was seized, it not unfrequently happened that the building itself, out of the piety of the person into whose hands it passed in the sale of the chantry lands, or the devotion of the persons living near it, and long accustomed to resort to it, continued to be used for religious worship in its reformed state, and remains to this day a place of Christian worship, the incumbent being supported by the casual endowments of the period since the Reformation, and especially by what is called Queen Anne's Bounty, in which most of the incumbents of chapels of this class have more or less participated.

2. The term chapel is used to designate those more private places for the celebration of religious ordinances in the castles or dwelling-houses of distinguished persons. We find in the fabrics of some of the oldest specimens of the castles of England some small apartment which has evidently been used for the purposes of devotion, and this sometimes in the keep, the place of last resort in the time of a siege. A remarkable instance of this is at Conisbrough, in Yorkshire. But more frequently chapels of this kind were erected adjoining the apartments appropriated to the residence of the family. Most of the baronial residences, it is probable, had chapels of this kind. How splendid they sometimes were we may see in Saint George's Chapel at Windsor and Saint Stephen's Chapel at Westminster, both chapels of this class attached to the residences of our kings.

3. The chapels of colleges, as in the two universities; of hospitals, or other similar foundations.

4. Chapels for private services, chiefly services for the dead, in the greater churches, as the chapel of Saint Erasmus, and others, in the church of Westminster. Additions made to the parish churches for the purpose of chantries are sometimes called chantry chapels.

5. Places of worship of modern foundation, especially those in towns, are called chapels of ease, being erected for the ease and convenience of the inhabitants when they have become too numerous for the narrow limits of their parish church. Most of these are founded on special Acts of Parliament, in which the rights and duties of the incumbent and the founders are defined.

6. The word chapel is pretty generally used to denote the places of worship erected by various sects of Dissenters under the Act of Toleration, though the Quakers and some of the more rigid Dissenters of other denominations, out of dislike to the nomenclature of an ecclesiastical system which they do not approve, prefer to call such edifices by the name of meeting-houses.

CHAPEL EN LE FRITH, a market-town and in the hundred of High Peak, county of Derby, [illegible] from Buxton, 21 miles N.W. by W. from Derby, and [illegible]7 N.W. by N. from London. It includes the townships of Bowden's Edge, Bradshaw Edge, and Coomb's Edge, and contains [illegible]34 inhabitants, most of whom are employed in the manufacture of cotton or paper. The Peak Forest lime-works lie three miles east of the town, and communicate, by railway, with the Peak Forest canal, which runs within three miles to the N.W., in consequence of the vicinity of which there is a large carrying trade here. There is a small market on Thursday, and numerous fairs in the course of the year for the sale of cattle, wool, and provisions. There are places of worship for the Episcopalians and Wesleyan Methodists. The church, dedicated to St. Thomas à Becket, was rebuilt at the beginning of the last century. The living is a perpetual curacy, in the jurisdiction of the dean and chapter of Lichfield, having 400*l.* private benefaction, 400*l.* royal bounty, and 300*l.* parliamentary grant, and in the gift of the resident freeholders, who choose a committee of twenty-seven from the three townships, by a majority of whom the minister is elected. There is an endowed school at Chapel en le Frith, where nineteen scholars are taught, and another at Bowden's Edge for the instruction of eight girls. A library has been recently established. The town is not lighted, and only partially paved. Its elevation above the level of the sea at low water is 566 feet. The High-Peak court for the recovery of small debts is held here every third week, at which the duke of Devonshire's steward presides. About two miles south is a Roman road and the remains of other antiquities.

CHAPEL HILL. [CAROLINA, NORTH.]

CHAPLAIN, *capellanus,* a word formed immediately on the word chapel, *capella,* according to one of the commonest analogies of our language.

A chaplain is properly a clergyman officiating in a chapel, in contradistinction to one who is the incumbent of a parish church. But its more frequent use is now as designating clergymen who are either (1) residing in families of distinction and actually performing religious services in the family; or (2) who are supposed to be so, though not actually so engaged. This fiction proceeds on the assumption that every bishop and nobleman, with some of the great officers of state, have each their private chapel, to which they nominate a priest, or more than one. Certain privileges respecting the holding of benefices belong to these chaplains, by reservation out of the Act against Pluralities, 21 Henry VIII., c. 13. By the same act the number of chaplains which noblemen and other persons may nominate was limited: an archbishop may nominate eight; a duke or a bishop, six; a marquis or earl, five; a viscount, four; a baron, a knight of the garter, or the lord chancellor, three; the treasurer of the king's house, the comptroller of the king's house, the clerk of the closet, the king's secretary, the dean of the chapel, the almoner, and the master of the rolls, may nominate each two; the chief justice of the King's Bench and the warden of the Cinque Ports, each one; a duchess, marchioness, countess, and baroness, being widows, are allowed to nominate each two.

CHAPPE, CLAUDE, a French mechanician, who, though not the original inventor of a machine for transmitting intelligence with rapidity between places very distant from each other, must be considered as having devised the means of rendering such a machine available for that purpose. He was a nephew of the Abbé Chappe d'Auteroche, and was born at Brulon, in Normandy, in 1763. It is said by his French biographers that, happening on some occasion in his youth to be separated from his friends, he conceived the idea of corresponding with them by means of signals; and that the result of his efforts to obtain this end, was the invention of the machine which he called a telegraph (τῆλε and γράφω), or a semaphore (σῆμα and φέρω). Whether or not he had at that time any knowledge of the discoveries of Dr. Hook, in England, or of Amontons, in his own country, both of which were nearly a century earlier, is uncertain; but there appears to be some resemblance between his machine and that which was proposed by the former in his discourse to the Royal Society in 1684. Be that as it may, no doubt can exist that M. Chappe is justly entitled to the honour of having invented both a particular system of signals and the mechanism by which the operations are performed.

[illegible] machine consisted of a vertical pillar of wood, fifteen [illegible]een feet high, at the top of which was a transverse [illegible] eleven or twelve feet long, which turned on a joint at [illegible], and was capable of being placed at any angle with the pillar; and at each extremity of the beam was a secondary arm, which also turned on a joint, and could be placed either in the same direction as the beam, or at any angle with it, upwards or downwards. The various positions of the beam and secondary arms were to serve as indications of the letters of the alphabet, and of the ten numerals; the sentence to be transmitted was to be exhibited letter by letter from the first telegraph to the next in the line; it was to be repeated in the same manner from the second to the third, and so on to the last.

M. Chappe presented his invention to the French Legislative Assembly in 1792, when the revolution had disposed the minds of men for the reception of any novelty which promised to be of national utility; and in the following year the government decreed that an experiment should be made, in presence of certain commissioners, in order to try its efficacy. For this purpose there was formed between Paris and Lisle, at distances from each other equal to three or four leagues, a line of stations, at each of which one of the machines was constructed; and the first, which was immediately under the direction of the inventor, was placed on the roof of the Louvre. The sentence to be conveyed was received there from the hands of the members composing the Committee of Public Safety, and in 13 minutes 40 seconds, it was delivered through all the intermediate stations to that at Lisle, a distance of 48 leagues. The result of the experiment being considered satisfactory, the use of the machine became general in France; and it is said that one of the first dispatches conveyed in this manner to Paris announced the re-taking of the town of Condé.

The important advantages which might be derived from the use of the telegraph were immediately felt. A description of it was brought by an emigrant from Paris to Frankfort on the Maine, where two models were executed, which, from thence, were sent to England by Mr. W. Playfair; and the invention, with modifications, was adopted in this country.

The claim of M. Chappe to the honour of being the inventor of this kind of machine appears to have been disputed by some of his contemporaries, who also invidiously represented its imperfections or exposed the mistakes which, as they asserted, might be made in using it; and these circumstances are said to have so preyed on his mind, that he fell into a profound melancholy, which terminated his life in 1805, at the age of 42 years.

CHAPPE D'AUTEROCHE, JOHN, born 1722 (1728, Delambre), died, 1769, in California, whither he had gone to observe the transit of Venus. He succeeded Lacaille at the observatory of Paris, as assistant to Cassini de Thury, and published Halley's Tables, in 1754. For his travels to Siberia and to California, &c., see Delambre's *Hist. d'Astron. XVIII. siècle.*

CHAPTAL, JEAN ANTOINE, a distinguished French chemist, was born in 1756, at Nozaret (Lozère). His education commenced at Mende, from whence he repaired to the School of Medicine at Montpelier, and afterwards to Paris. In 1781 he was appointed to the Chemical chair recently founded by the States of Languedoc. Inheriting a large fortune from his uncle, he established some important chemical manufactories in his adopted city, and thus bestowed upon France several valuable products which were previously obtained from foreigners. In 1793 Chaptal was called to the capital by the Committee of Public Safety, to manage the manufactory of saltpetre, which substance could no longer be obtained from India, and the want of which was pressing. The great establishment of Grenelle thus became the scene of that zeal and ability of which Chaptal gave so many proofs during the whole of his existence. He was one of the first professors of the Polytechnic School; and the Institute elected him a member in the place left vacant by the death of Bayen. After the establishment of the consulate, Napoleon called him to the Council of State. In the year 9 (1801) he appointed him Minister of the Interior, and towards the end of the year 12 he retired from these high appointments. During his administration of four years he conferred many benefits upon the state. Devoting much time to the examination of charitable establishments, which had suffered from the misfortunes of the times, he liquidated their debts; and originated several new institutions for the amelioration of the condition of the poor. As might however be expected from his habits, it was to the manufacturing interests of his country that his attention was principally directed; he established chambers of commerce, and consulting councils of arts and manufactures; the School of Arts and the Conservatory, which have become an important seminary and a great museum, are monuments of his enlightened solicitude for increasing the opportunities and means of instruction. He published useful processes, visited the manufactories, conversed with the workmen, offered them his advice, applauded their discoveries, and encouraged the importation of processes and apparatus from abroad; in fact, he extended his views and his care to every substance and circumstance which he considered favourable to the improvement of manufactories.

M. Thénard, in his discourse pronounced in the name of the Academy of Sciences, has thus drawn the character of Chaptal: 'He was endowed with a kind heart, of a mild and gentle character, moderate in tastes and opinions, full of benevolence towards every one, of affectionate regard for his associates, of devotion to his friends; ready to confer a favour when in his power, and doubling it by the grace with which he conferred it; unhappy when compelled to refuse, and always softening the refusal by expressions which showed the goodness of his heart. Possessing a handsome fortune, which he had honourably acquired, and loaded with honours, Chaptal seemed safe from reverses. Nevertheless some disappointments which he could not foresee, and certainly did not merit, obscured the close of his brilliant career; but he supported them with dignity, without murmuring, and without breathing a complaint, and so as entirely to evince the greatness of his mind. He consoled himself among his friends, by study, and by fulfilling duties which had been imposed upon him, or which he had created for himself. Too well informed not to understand the nature of his disease, and feeling his end approaching, he resigned himself like a philosopher, and making the requisite arrangements for leaving a world where he had but few days to remain, he died beloved and surrounded by his numerous family, bestowing on them his blessing as his last farewell.' He died at Paris, 29th July, 1832, in the 76th year of his age. He was a senator under the Empire, and at the time of his death he was Peer of France and a Grand Officer of the Legion of Honour. He was one of the first founders of the Society of Encouragement, over which he presided many years.

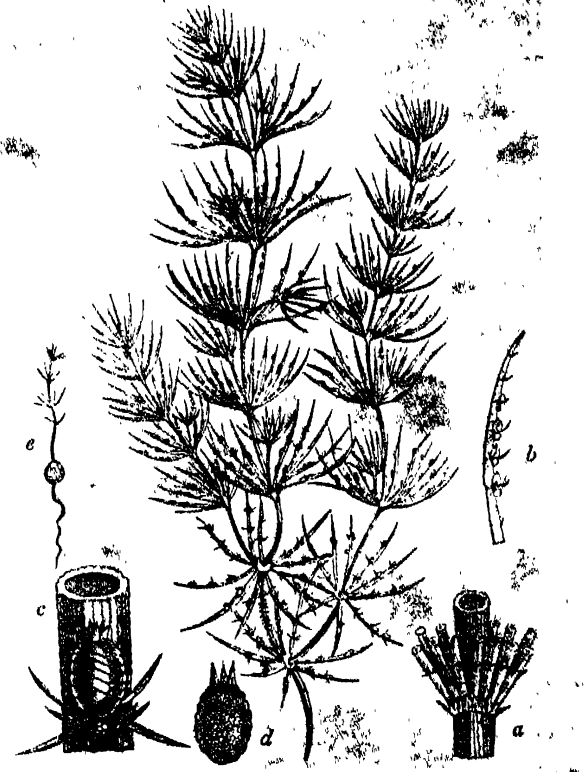
Chaptal's principal works are 'Elémens de Chimie,' 3 vols., 8vo. The first edition appeared in 1790, and the fourth in 1803. It has been translated into most languages. 'Essai sur le Perfectionnement des Arts Chimiques en France,' 8vo., 1800; 'Art de Faire, de Gouverner, et de Perfectionner les Vins,' 1 vol., 8vo. (first edition 1801, second, 1819); Traité théorique et pratique sur la Culture de la Vigne,' 2 vols. 8vo. (first edition, 1801; second in 1811); 'Art du Teinturier et du Dégraisseur,' 8vo., 1800; 'Essai sur le Blanchiment,' 8vo., 1801; 'Chimie appliquée aux Arts,' 4 vols., 8vo., 1807; 'Art de la Teinture du Coton en Rouge,' 8vo., 1807; 'De l'Industrie Française,' 2 vols., 8vo., 1819; 'Mémoire sur le Sucre de Betteraves,' 8vo. (first edition, 1815; second edition, 1821); 'Chimie appliquée à l'Agriculture,' 2 vols. 8vo. (first edition, 1823; second edition, 1829).

CHAPTER. The canons in the cathedral or conventual churches, when assembled, form what is called the chapter, *capitulum*, anciently the council of the bishop. [CANON.] Other religious communities, when assembled for business, sat in *chapter*. Attached to many cathedral and conventual churches are buildings for the meeting of the chapter, called chapter-houses. The buildings of this kind connected with the churches of Westminster and York are octagonal and of singular beauty.

The members of the College of Arms, that is, the king's heralds and pursuivants, are said to hold a *chapter* when they sit together to confer on the business of their office.

CHAPTER HOUSE. [CHURCH.]

CHARA'CEÆ, a curious group of plants inhabiting pools and slow streams, to which they communicate a nauseous offensive odour, which is said to become a pestilential miasma when, as in the Campagna of Rome, the plants are in great numbers. They are jointed leafless plants, with verticillate branches, composed either of one or of several tubes adhering in bundles, and either encrusted with calcareous matter (Chara), or transparent (Nitella). Botanists are not agreed whether they are flowering or flowerless plants, their organs of reproduction being of so anomalous a nature as to correspond with nothing that has been observed in other plants. One of these organs, named a nucule, is an oval sessile spirally striated body, with a five-cleft apex, and a number of grains in its interior; this has been looked upon as the pistil, and has been seen to grow into a young plant. The other, called the globule, is a [illegible]ish body consisting of triangular scales, inclosing a mass of elastic wavy threads, and has been named an anther. There is, however, no proof that it acts as a male organ, and [illegible] no apparent analogy with the genuine anthers of flowering [illegible]. Hence it is most generally thought that Characeæ [illegible] a small group among the flowerless class of the vegetable kingdom. They are highly interesting on account of the facility with which they exhibit the circulation of their fluids, and because of the light they thus appear to throw upon some of the more obscure of the phenomena of vegetable life. If one of the tubes of a chara be observed under a pretty good microscope, by the aid of transmitted light, the fluid it contains will be distinctly seen to have a motion up one side of each tube, down the other, and then up again, after the manner of a jack-chain, and this goes on continually as long as the plant remains alive. No spectacle that we are acquainted with is more beautiful than this, if it is well seen with the aid of a good microscope. It is so interesting indeed that a microscope for the purpose of viewing it has been invented by Mr. Horseman Solly. Of this and the phenomena in the Chara, a good account will be found in the *Transactions of the Society of Arts*, vols. xlix. and l.



[Chara.]

a, a portion of tubular stem, showing the bases of a whorl of leaves; *b*, leaf, bearing the organs of fructification; *c*, a single organ of fructification, greatly enlarged; *d*, upright section of the fruit; *e*, plant germinating.

CHARACTERISTIC (of a logarithm). The whole number, positive, or negative, which precedes the decimal point of a logarithm. The reason of this number having a separate name is, that in Brigg's system it is so easily found as not to form a part of the tables. [LOGARITHM.]

CHARADE, a species of riddle, in which a word consisting of several syllables is indicated, first by an enigmatical description of each syllable, taken separately, and then by a similar description of the whole. It does not seem to be necessary that the word should consist only of two syllables, according to the definition given in most of our English dictionaries and cyclopædias. To have anything of wit or point, a charade should be so contrived that the ideas employed to denote or suggest the several syllables, and the entire word, shall be all in some way connected together, [illegible] arise naturally the one out of the other. This, however, [illegible] often neglected. A little book, professedly intended for the amusement and instruction of young people, has lately been published under the title of 'Five Hundred Charades from History, Geography, and Biography, by Eliza Wakefield,' in which there is not, we believe, [illegible] real Charade, according to the meaning which the word must be understood to have even as a species of false wit; for certainly there is no wit of [illegible] in describing, for instance, the word *Eton*, by saying [illegible] its first syllable is a word signifying what we all d[illegible] second, a preposition; and its whole, a town in Buckinghamshire noted for its public school. There is no more wit in this than there is in simply spelling the word. There is a little German work entitled 'Räthsel und Charaden zur Schärfung der Denkkraft für die Jugend, Nürnberg,' 1817, which appears to have something of the same design with Miss Wakefield's performance, but to be much more artificially compiled. The following, which we find in the late editions of the dictionary of the French Academy, is not a bad example of a true charade; 'My first makes use of my second to eat my whole;' the translation being the word *chiendent* (dog's [illegible].) The word Charade is said to be derived from the name of the inventor of this particular species of enigma. The term appears to be originally French, and not to have come into use till towards the end of the last century.

CHARADRI'ADÆ. [Plovers.]

CHARADRIUS. [Plovers.]

CHARÆ'AS (Stephens), a genus of moths of the family *Noctuidæ*. Technical characters: wings more or less denticulated; the posterior wings usually whitish in the males, and brown in the females; palpi short, two-jointed; maxillæ long; antennæ rather long, simple in the females, and more or less pectinated in the males; head small; thorax large, not crested; apex of the body furnished with a tuft of hairs in the males.

Five species of this genus have been found in England; their larvæ are naked, feed upon roots, and assume the pupa state underground.

Charæas graminis varies from an inch to an inch and a half in width, measured from tip to tip of the wings when expanded; it is of a brownish colour; the upper wings have a longitudinal white streak, which extends beyond the middle, and gives out three branches at the apex: touching this white line above there are two pale brown spots, and another of the same colour beneath, near the base of the wing; the apex of the wing has a row of pointed black spots, more or less distinct.

The caterpillar is of a brownish colour, with yellow streaks on the sides and back: it feeds upon grasses, and is exceedingly destructive to the pastures in Sweden. In England the insect is not so abundant; there is however an instance on record of its having committed considerable devastation in the north of England during the larva state. We allude to an account given by Mr. Wailes, in the second volume of the 'Entomological Magazine,' who observed a portion of the mountain of Skiddaw thus affected—their devastation causing the herbage to have a dry and parched appearance: the part affected comprised at least fifty acres, and extended some distance down the western side of the mountain; and so marked was the line, that the progress made by the larvæ could be distinctly seen from the town of Keswick. Large flocks of rooks were observed to frequent the spot, and no doubt devoured immense numbers; the moths however appeared in great abundance in the month of August. From this same gentleman's observations, we find that the history of the moth is also interesting. It appears to be their habit to fly from about half-past seven to half-past eight in the morning, during which time they are seen in some parts of the country in the utmost profusion; their appearance and disappearance are extremely sudden. The field in which Mr. Wailes observed them became in one moment a moving mass, and after about an hour not a single moth was to be seen, all having disappeared in a manner equally sudden: they fly about three or four inches from the ground, and thread their way with considerable rapidity through the stalks of grass. This moth is by no means abundant in the south of England: it departs a little from the characters of the genus in not having the wings notched.

CHARCAS. [Bolivia.]

CHARCOAL is the impure carbon obtained by the decomposition of ________ matter by heat without the access of air; during this operation the more volatile elements of the woody fibre are expelled as new compounds, while the carbon, the fixed ingredient, remains, mixed however with saline matter, presently to be noticed, which renders

What occurs during the preparation of charcoal will be readily understood by referring to the analysis of woody fibre by MM. Gay Lussac and Thénard, who found, whatever be the kind of wood employed, that after drying at 212° Fahr. it yielded upon an average

Carbon . . .	52
Hydrogen . .	5·3
Oxygen . . .	42·7
	100·0

Now as the oxygen and hydrogen are almost exactly in the proportions required to form water, it would appear, tha if these only could be expelled by heat, the products o the decomposition would be carbon and water. We shal however presently mention, that owing to the combinatio of a part of the carbon with these elements, and also of th oxygen of the air, the compounds which arise from th decomposition of wood are much more complicated, and ar of very great importance.

The making of charcoal for domestic uses, and probabl also for such manufacturing or metallurgic processes as th antients were acquainted with, is of high antiquity. Plin (lib. 16. c. 6,) mentions that the wood was formed into a pile the top of which was covered with clay*; evidently to preven the access of too much air, by which, as experience had n doubt taught, it was found that the wood was converte entirely into ash.

Charcoal is now prepared by two different methods: one resembling in principle that just mentioned, is that o piling the wood in a heap, which is covered with turfs and sand to allow of the entrance of such a portion only of atmospheric air as is sufficient to carry on the imperfect combustion required. The heap is fired at several holes lef near the bottom, and a draught of air is obtained by at firs leaving an orifice at the top of the heap; this is afterwards covered, and when it is found that the flame has pervaded the heap entirely, the bottom holes are also closed. When the mass has cooled, the charcoal remains.

Within a comparatively few years another method of obtaining charcoal has been adopted, by which the article obtained is said to be better adapted for the purpose of making gunpowder. This is done by putting the wood into iron cylinders, which are set in brick-work and surrounded b fire; the wood in the cylinders has no communication with the external air, and they have only a small opening t allow of the escape of the gaseous products arising from the decomposition of the wood, and the new compounds derived from the combination of its oxygen and hydrogen with a portion of the carbon.

These products, or at least those which are condensible, are chiefly water, tar, impure acetic acid, usually called pyroligneous acid [Pyroligneous Acid], creosote [Creosote], pyroxylic spirit [Pyroxylic Spirit], and empyreumatic oil. One hundred parts of oak wood dried in the air yielded 43 of pyroligneous acid, about 4·5 parts of carbonate o potash, 9·06 parts of empyreumatic oil, and 26·2 of carbon; different woods yielded somewhat varying proportions o these substances, but the oak gave the largest quantity o charcoal.'

Although the charcoal thus procured is preferable fo making gunpowder, yet it is stated that it is not so well liked for many other purposes; it is also said to be much lighter than that made in the usual way, and this appears to occasion some variation in the degree of heat required fo its consumption in a given time, and thus influences many operations. The densest charcoal gives the most heat while burning.

The general properties of charcoal are, that it is black, sonorous, and brittle, [illegible] retains the form of the wood from which it is obtained; it [illegible] soluble in water; infusible and fixed in the most intense heat ever produced. It is a very bad conductor of heat, but conducts electricity. Its property of condensing various gaseous bodies has been already noticed, as well as the compounds which it forms with some other elements. It has considerable antiseptic powers. [Carbon.]

It has been mentioned that certain impurities exist in the charcoal of wood; thus when 100 parts of old oak wood are entirely burnt, there remain about 5 parts of ashes, and different woods furnish very different proportions of them; these ashes are principally carbonate of potash [Potassium], unquestionably derived from the decomposition of some salt containing a vegetable acid, as the tartaric or malic. It appears extremely [illegible] le, that the spontaneous combustion which charcoal has been known occasionally to undergo, has been occasioned by a portion of this potash having been reduced to its metallic state, and the subsequent action of moisture upon it. For an account of the different quantities of charcoal and ashes obtained from different kinds of wood, see Dumas, *Traité de Chimie*, tome i., p. 558; and see also in *Phil. Mag.*, vol. iii., a paper by M. Mushet on the same subject.

CHARCOAL, ANIMAL. Common charcoal possesses to a certain extent the power of destroying vegetable colour; but this property exists in a much higher degree in what is called animal charcoal, or that obtained by the decomposition of the carbonaceous portion of bones. To prepare this, bones are heated in iron cylinders, and the charcoal remains with the phosphate of lime in them, constituting what is commonly called ivory or bone-black; a large quantity of carbonate of ammonia and various gaseous products are formed at the same time.

This ivory-black is used as a coarse black pigment; but it is now become a very important article from its decolouring property, and is extensively used on that account in sugar refining. [SUGAR.]

CHARD BEET, a variety of *Beta cicla*, cultivated for the sake of the strong succulent ribs of its leaves, which are boiled and eaten like sea-kail and asparagus. They are ready for table in October and November, but having a strong earthy flavour which no cooking can entirely conceal; they are seldom seen in this country. The French call this Beet *Poirée aux cardes*. It is sown and managed like common beet, but it produces no root fit for the table.

CHARDIN, SIR JOHN, was born at Paris in November, 1643. His father, who was a Huguenot or Protestant, carried on the business of a jeweller in the French capital, and brought up his son to the same profession. As soon however as Chardin was of age, in order to gratify his taste for travelling, and 'to endeavour the advancement of his fortunes and estate,' he left France for the east. During his first journey, which lasted from 1664 to 1670, he visited Persia and the East Indies, and returning to Paris, he published, in 12mo., 'An Account of the Coronation of Solyman III., Schah of Persia.' During his residence in Persia, he gained access to the court, and was appointed agent to the Schah, who commissioned him to make purchases of jewels and trinkets for him in Europe. At the end of 1671 Chardin again departed for Persia, by the route of Constantinople, the Black Sea, and Armenia. He arrived at Ispahan in June, 1673, and remained in Persia till 1677, 'chiefly,' he says, 'following the court in its removals, but also making some particular journeys, as well of curiosity as business, to prosecute my intentions, studying the language, and assiduously frequenting the most eminent and most knowing men of the nation, the better to inform myself in all things that were curious and new to us in Europe.' Few travellers have been so conscientious and pains-taking, or have had such good opportunities of acquainting themselves with the country and the manners and customs of Persia. He spoke the language like a native, he knew Ispahan better than Paris, and he visited nearly every part of the country, traversing, he says, 'the whole length and breadth thereof.'

In April, 1681, he came to London, where he settled as jeweller to the court and nobility. On the 24th of the same month of April, 1681, he was knighted by Charles II., and on the same day married to a young lady, the daughter of a French Protestant refugee, from Rouen. In the following year he was elected fellow of the Royal Society, which had recently been established, and some papers, written by Sir John, appear in the earliest numbers of the Transactions of that society. He continued to carry on a considerable trade in jewels, prosecuting, at the same time, his studies of the oriental languages and antiquities. He did not publish an account of his eastern travels until 1686, and then he only brought out the first part of them, being his journey from Paris to Ispahan (*Travels* of Sir John Chardin, fol. Lond. 1686.) This volume, with an unfortunate prophecy of future glory and a long reign, was rather pompously dedicated to James II., who, two years later, was driven om his throne. Chardin was a good courtier, but he had ligations to acknowledge to James, as well as to Charles The latter king had employed him diplomatically on important mission to Holland, and in 1683, Sir John had at the Hague and Amsterdam as agent for the English East India Company. [illegible] 11 appeared the second part of his travels. During [illegible] latter years of his life he lived at Turnha[illegible] and, according to an entry in the church books, he was buried at Chiswick, on the 29th of December, 1713. His travels have been translated into various languages, and often reprinted. There is a very good edition (in French) in 4 volumes, 4to., with plates, published at Amsterdam in 173[illegible] hich we have consulted; but the last and best edition is [illegible] to be that of Paris, 1811, in 10 vols., 8vo., with notes, by [illegible]glès, which we have not seen.

About sixty years after his death, some MS. notes which Chardin had written in India to illustrate passages in the Scriptures by a comparison of modern eastern usages, and which had long been lost, were recovered by his descendants, who advertised a reward for them. They were nearly all incorporated in Mr. Harmer's 'Observations on divers passages of Scripture, illustrated by books of travels,' &c.

CHARENTE, a river of France, rises in the high grounds between the towns of La Rochefoucauld (department of Charente), and Rochechouart (department of Haute Vienne), and flows N.W. through a narrow valley to the neighbourhood of Civray, where it makes a bend, and then flows southward near the town of Ruffec, to Mansle, which is on the high road from Poictiers to Angoulême; at Mansle it receives the united waters of the Tardoire, the Bandiat, and the Bogneure. Its course is then very winding, first westward, and then again southward, to Angoulême, some miles above which it becomes navigable. From Angoulême it flows westward to Saintes, and from thence N.W. in a very winding channel to the Bay of Biscay, which it enters just opposite to the Isle of Oléron. The towns which it passes below Angoulême are Châteauneuf, Jarnac, Cognac (on the left bank), Saintes, Tonnay-Charente, and Rochefort; the two last are on the right bank. The only tributary of any importance which it receives is the Boutonne, which rises in the department of Deux Sèvres, and becomes navigable at St. Jean d'Angély. The length of the Charente may be estimated as follows:—from the source to Civray, 41 miles; from thence to the point where the navigation begins, 42; from thence to Angoulême, 18; from thence to the sea, 83; total, 184 miles, of which above 100 are navigable.

The basin of the Charente is bounded on the N.E. by a series of heights, which extend in a waving line from the great central mass of the mountains of Auvergne towards the mouth of the Loire, separating this basin from that part of the great basin of the Loire which is traversed by the Vienne. In a narrow valley formed by two parallel branches of this range of heights the Charente takes its rise. On the S.E. the basin is bounded by high land branching off from the heights just mentioned, near the town of Chalus, and running towards the junction of the Dordogne and the Garonne. The undulations of the soil in the district thus enclosed afford shelter, which is favourable to the productions of agriculture. Wheat and maize are grown; calves are reared, and bullocks fattened. Chestnut trees of different kinds (*châtaigniers et marronniers*) yield plenteous crops; and flax is also raised; but the most important object of cultivation is the vine. The brandy of this part of France, known in this country as the Cognac brandy, is the finest that is made, and the exportation is very considerable. Great quantities of gypsum are procured in the valley of the Charente.

The Charente was known to the Romans by the name of Carantonus.

CHARENTE, a department of France, taking its name from the river just mentioned, and comprehending the former province Angoumois, with part of Saintonge. It is of irregular form, bounded on the N. by the department of Vienne, on the E. by the department of Haute Vienne, on the S.E. by the department of Dordogne, on the S.W. and W. by the department of Charente Inférieure, or Lower Charente, and on the N.W. by the department of Deux Sèvres. Its greatest length is from N.E. to S.W., 75 miles; its greatest breadth, measured at right angles to the above, is 53 miles. Angoulême, the capital, is 242 miles from Paris in a direct line S.S.W., or 288 miles, by the road through Orléans, Blois, Tours, and Poitiers. The area of the department is about 1741 geographical square miles, according to M. Balbi, which is equal to about 2269 square English miles; nearly the extent of the English counties of Stafford and Derby taken together. The population in 1832 was 362,531, or 160 to a square mile.

The N.E. side of the department is traversed by that range of heights mentioned in the last article as separating the basin of the Charente from [illegible] of the Loire; the department however extends [illegible] these heights, and includes a portion of the plain wat[illegible] by the Vienne. The heights which skirt the basin of the Charente on the S.E. side traverse the department on the S. part; while on the N.E. side extend the uplands which divide the valley of the Charente itself from that of its tributary the Boutonne. The most extensive plain is that which is watered by the Charente, and occupies the centre of the department. The rivers are, the Charente, and its tributaries, the Tardoire, Bandiat, Bogneure, Touvre, and others (all of which are unsuited for navigation, except the Touvre and the Charente itself), the Vienne, which is not navigable within the limits of the department, and the Dronne, also not navigable, which skirts the southern boundary of the department. The inland navigation is therefore confined to the Charente and the Touvre, in the neighbourhood of Angoulême, and below it. The only great road which traverses the department is that from Paris to Bordeaux: there is a third class road which comes from Rochelle, Rochefort, and Saintes, enters the department near Cognac, and runs on to Angoulême, whence two other roads of the same class run, one to the N.E. to Limoges, and thence into central France; the other S.E. to Brantôme and Perigueux.

The nature of the soil, and the agricultural productions have been noticed in the foregoing article, which applies to the central plain of the department, and in the article ANGOUMOIS, a division under the old monarchy, nearly coinciding with this department. We have only to add here that the quantity of brandy annually produced is estimated at 35,000 puncheons, averaging about 110 gallons each, which are either sent to the other parts of France, or are exported to foreign countries. The number of horned cattle brought yearly into the department, and sent out of it again after being fattened, amounts to 30,000. The soil is considered to be divided in tolerably equal portions between the vineyards, the arable land, and the woods, pasture lands, and wastes. (Malte Brun.)

The department of Charente is divided into five arrondissements—Angoulême in the centre (population in 1832, 128,391); Confolent, or Confolens, in the N.E. (population, 67,222); Ruffec, in the N.W. (population, 58,745); Cognac, in the W. (population, 50,131); and Barbezieux, in the S. (population, 58,042).

The chief towns are, Angoulême, the capital of the department (population in 1832, 15,186); and Barbezieux (population, 2437 for the town, or 2756 for the whole commune) [ANGOULEME, BARBEZIEUX]; Cognac, Confolens, Ruffec, La Rochefoucauld, Jarnac, and Mansle, or Manles.

Cognac, 24 miles W. of Angoulême, is beautifully situated on a small eminence on the left bank of the Charente. It has an antient castle with a park near it. Under an elm near this castle, Francis I., king of France, was born. His mother, Louisa of Savoy, was walking, when she was taken with the pains of childbirth, and, being unable to return to the castle, was delivered under the tree. An enclosure of masonry surrounded the spot; but the tree has decayed, and been replaced by another, planted in its stead, and the enclosure has been destroyed in order to widen the road. Cognac had, in 1832, 3101 inhabitants for the town, or 3409 for the whole commune. It is a busy place, the centre of the trade carried on for the brandy of the surrounding district. Leather, paper, and porcelain, are also manufactured; and near the town is a quarry, which supplies abundance of gypsum. There is a high school, and an agricultural society.

Confolens is on the right bank of the Vienne, at the confluence of the little stream, the Goire, with that river. The banks of these streams afford good pasturage, in which many oxen are fattened; but the neighbourhood is generally sterile. There is a lead mine not far from the town. Confolens has a square tower, the only remaining part of the old castle. The population in 1832 was 2215 for the town, or 2687 for the whole commune.

Ruffec is on the great road from Paris, through Angoulême, to Bordeaux, 29 miles from Angoulême; it is on a small rivulet, containing excellent trout, which runs into the Charente, and is not far from the right bank of the latter river. It is a pretty town, well laid out in the midst of a district producing grain and grass. The population in 1832 was 2793 for the town, or 3004 for the whole commune. This place has a considerable reputation for good cheese, higher perhaps than is deserved. The neighbourhood produces some truffles, but not any great quantity.

La Rochefoucauld is on the road from Angoulême to Limoges, 12 miles from the former, on the banks of the Tardoire. [illegible] of a single street, and is commanded by the antient castle of the dukes of La Rochefoucauld. The author of the well-known Maxims was born in this castle. There is an hospital, founded by one Gourville, originally a servant of one of the dukes, who came to be considered as the friend of his master, and of the great Condé. The castle, which consists of four round towers, and a square tower (the donjon, or keep) of greater antiquity than the rest, was employed in 1812 as a public school: the park was then a public promenade. The inhabitants in 1832 amounted to 2403 for the town, or 2706 for the whole commune. They manufacture linen yarn, and leather.

Jarnac is chiefly remarkable for the battle fought under its walls in 1569, in which the Catholics under the duke of Anjou, afterwards Henry III., defeated the Huguenots under Coligny and the prince of Condé, the latter of whom was taken prisoner, and killed in cold blood by the marquis de Montesquieu, captain of the guard to the duke of Anjou. A monument, erected to commemorate the battle, was destroyed some years ago; but a new one has been erected. The population of the town in 1832 was 1850, of the whole commune 2282. A considerable trade in brandy is carried on.

Mansle is a small town, having (in 1832) a population of 1500, or 1785 for the whole commune. It is on the high road from Paris to Angoulême, about 17 miles from the latter. Upon entering the town from Paris, the traveller crosses the Charente by a lofty stone bridge, from which the river is seen on each hand meandering through beautiful meadows.

Aubeterre, a small town in the southern part of the department, is remarkable for its picturesque situation at the foot of a hill on the banks of the Dronne. There are the remains of an old castle; but the most singular object is the church, which is excavated in the hill on which part of the castle stands. The population, according to the '*Dict. Universel de la France*' (Paris, 1804), our latest authority, was under 700.

Among the articles of manufacture in this department may be noticed the paper of Angoulême, the linen of Barbezieux, and the leather of Rochefoucauld.

The department of Charente constutes the diocese of Angoulême, the bishop of which is a suffragan of the archbishop of Bordeaux. It is under the jurisdiction of the Cour Royale, or Assize Court of Bordeaux, and is comprehended in the twelfth military division, of which Nantes is the head quarters. It sends five members to the Chamber of Deputies. (Malte Brun, Balbi, Vaysse de Villiers, Millin, *Encyclopédie Méthodique*.)

CHARENTE INFE'RIEURE, or **LOWER CHARENTE**, a department of France, watered by the river Charente in the lower part of its course; from this river it takes its name. It comprehends the greater part of the provinces of Saintonge and Aunis. It is of an irregular form; and is bounded on the N. by the department of Vendée; on the N.E. by that of Deux Sèvres; on the E. by the department of Charente; on the S. and S.W. by the department of Gironde; and on the W. by the sea. It comprehends the three islands of Ré, Aix, and Oléron. The greatest length of the department is 98 miles, measured N.N.W. and S.S.E.; its greatest breadth, measured nearly at right angles to the length, is about 57 miles. The length of the sea coast is about 77 miles, exclusive of the islands; and the banks of the wide estuary of the Gironde extend for about 24 miles farther. The department is about 2346 English square miles (according to M. Balbi), nearly equal to that of the English counties of Dorset and Wilts, taken together. The population in 1832 was 445,249; about 190 to a square mile. The capital, La Rochelle, is about [illegible] miles in a direct line, S.W. of Paris, or 301 miles by the road, through Orléans, Tours, Poitiers, and Niort.

The department of Charente Inferieure has no very high lands; the hills are inconsiderable, and the plains extensive; the sea coast is low, and salt marshes furnish an abundance [illegible] good salt. From the midst of these marshes, spots of land sufficiently elevated to keep them from being inundated arise, and have obtained in France, as in England, the designation of 'Isles.' (*Encyc. Méthod.*, art. Aunis.)

The rivers which water the department are the Charente and its tributaries, the Seugne, the Boutonne, the Saudre, and the Sèvre. The Charente is navigable throughout the department; the Boutonne from St. Jean d'Angély. The Saudre rises in the southern part of the department, near St. Genis, a little town on the road from Saintes to Bordeaux, and, flowing to the N.W., falls into the sea opposite the isle of Oléron. Though its whole course is very short, not more than 45 miles, it is navigable for twelve or fifteen miles, from the little town of Saujon to the sea. The Sèvre has part of its course just within the northern boundary of the department, throughout which it is navigable: the navigation commences at Niort, in the department of Deux Sèvres. The south-western side of the department is washed by the Gironde, which separates this department from that of Gironde.

The coast is indented by the bays of Pertuis Breton, and Pertuis d'Antioche, which are sheltered to the S.W. by the isles of Ré and Oléron respectively, and form good roadsteds. The navigation is however impeded or endangered by rocks and sands, which extend far beyond low water-mark round the islands above mentioned; the coast generally shelves very gradually. Oysters and sardinias, a species of pilchards, abound on the coast.

Besides the navigable rivers above mentioned, a canal, called the canal of La Rochelle, extends from the Sèvre to the town of La Rochelle. The high roads from Paris to Rochefort (a road of the first class), and La Rochelle (a road of the second class), traverse the department in the northern part; and the great road from Paris to Bordeaux just crosses it in the S.E. Of roads of the third class there are several; three coming respectively from Niort, Lusignan, and Angoulême, unite at St. Jean d'Angély; one runs from La Rochelle to Rochefort, and another to St. Jean d'Angély; one from this last-named town, and one from Rochefort, unite at Saintes; from whence again two other roads run, one by Cognac to Angoulême, another by Blaye to Bordeaux. The department may be considered as better supplied with the means of communication by land and water than the average of France. To this advantage, combined with the excellence and number of the ports and roadsteds, may be ascribed probably the denser population of this department, as compared with that previously described. The colonial and the coasting trade, especially the latter, are carried on with considerable activity; and the inhabitants of the coast are also engaged in the cod fishery. The low marshes about the coast render that part of the department however very unhealthy; the air of the inland country is salubrious enough.

The tracts watered by the Charente are productive in corn, and in wine; the latter is chiefly converted into brandy. There is good pasturage also.

The department of Charente Inférieure is divided into six arrondissements: those of La Rochelle, population 77,589, and Rochefort, population 48,836, in the N.W.: that of St. Jean d'Angély, population 80,173, in the E.; that of Marennes, population 49,156, in the W.; that of Saintes, population 104,933, in the centre; and that of Jonzac, population 84,562, in the S.

The chief towns are La Rochelle, the capital of the department, on the sea, population in 1832, 14,632; Rochefort, a royal dock-yard and naval port, population 10,332 for the town, 14,040 for the whole commune; Saintes on the Charente, population 7521 for the town, 10437 for the whole commune; and St. Jean d'Angély on the Boutonne, population 5326 for the town, 6031 for the whole commune. [Jean d'Angely, St., Rochefort, Rochelle, Saintes.]

Marennes is about a mile from the sea, is well-built, and for its size and population a busy and wealthy place. The population, in 1832, was 1969, but the whole commune contained 4605. The neighbourhood produces a great quantity of brandy, which is sent into Picardie, Flanders, and the north of Germany; the peas and beans are also accounted excellent. There are considerable oyster-beds, and much salt is made from the brine of the salt-marshes. Marennes would probably be a place of much greater importance were not its increase checked by the unhealthiness of the situation. The neighbouring town of Brouage, which was, in 1600, the seat of an extensive commerce, has been reduced by the operation of the same cause to insignificance.

…… on the Seugne, a tributary of the Charente, had, in 1832, a population of 1798 for the town, or 2618 for the whole commune; its only consequence is derived from its official rank as the chief town of an arrondissement.

Marans is on the south or left bank of the river Sèvre, a few miles above its mouth, and about 14 miles N.E. of La Rochelle. It is in the midst of salt-marshes, and is almost inaccessible in the rainy season. It has sustained several sieges, and was taken in 1589 by Henry IV. There was a castle, which was rased in 1638. The population, in 1832, was 2770 for the town, or 4041 for the whole commune. There is a quay to which vessels of 100 tons can come up with the tide. The inhabitants manufacture good earthenware, and procure much salt from the marshes. A very considerable trade in corn and flour is also carried on, as well as in brandy, hemp, flax, wool, ship timber, and tre[illegible]

St. Savinien is on the right bank of the Charente, between Saintes and the confluence of the Boutonne with the Charente. The inhabitants, who, in 1832, were 2465 in the town, or 3559 in the whole commune, carry on trade in brandy, grain, and pottery-ware. Good white building stone, suitable for almost any kind of work, is quarried; and mussels of considerable size are fished, which frequently contain pearls of some value.

La Tremblade is near the sea, just to the south of the river Saudre. It had, in 1832, 2400 inhabitants for the town, or 2504 for the whole commune. The chief trade carried on is by sea, and the articles of commerce are salt, wine, brandy, and vinegar. The '*Dict. Universel de la France*, 1804,' mentions glass as an article manufactured here.

Pons is on the road from La Rochelle, by Rochefort and Saintes, to Bordeaux, about 56 miles from La Rochelle, and 12 S. of Saintes. It is supposed to owe its name to the numerous bridges which here cross the little river Seugne, a tributary of the Charente, on which the town stands. It has an antient castle, which commands the town; and before the revolution had three churches, three hospitals, and a commandery of the Order of Malta. It is divided into two parts; the upper town, or St. Vivier, and the lower town, or Aires or St. Martin. Pons was a place of some importance in the feudal ages; and was one of the fortified towns of the Huguenots, in their struggle against Louis XIII. and his minister Richelieu. Population, in 1832, 2275 for the town, 3726 for the whole commune.

Tonnay Charente is on the Charente, about 5 or 6 miles from Rochefort. It is a town of considerable antiquity, and its castle was formerly in the hands of the family of Mortemare; the eldest son of the duke of Mortemare bore the title of 'Prince of Tonnay Charente.' Its harbour admits vessels of 100 tons, and it is the centre of a considerable trade: nearly all the Cognac brandy that is sent to England is exported from here. Salt is made also in the neighbouring marshes. Population, in 1832, 1791 for the town, 3206 for the whole commune. Tonnay Boutonne is a small town on the Boutonne, between Rochefort and St. Jean d'Angély.

Royan is on the coast, just at the mouth of the river Gironde. The population in 1832 was 16[illegible] for the town, or 2589 for the whole commune. It has a small harbour, convenient for small vessels. The fishermen take great quantities of sardinias, which are in high repute for their size and goodness. This town was held by the Huguenots in the religious dissensions of the reign of Louis XIII., and was not taken by that prince's army without considerable difficulty. After its capture the fortifications were rased, and a considerable part of the town destroyed. The country around is fertile and agreeable.

Surgères is on the road from Paris to Rochefort, 17 miles from the latter. The inhabitants, who in 1832 were 1683 for the town, or 1979 for the whole commune, carry on trade in horses, sheep, and oxen, white wine, and brandy. There is an antient castle.

Brisembourg, a village on a bye road from St. Hilaire, near St. Jean d'Angely, to Cognac, is known for its pottery; and Mirambeau, 27 miles S. of Saintes, and Cozes, between Pons and Royan, have a considerable trade in agricultural produce; the former in grain, fruit, and wine; the latter in mules. Saintes appears to be the chief manufacturing town in the department; light woollen goods, hosiery, and leather are made there. Sugar is refined at La Rochelle. The chief places of trade in brandy, which may be considered as the staple of the department, are La Rochelle, St. Jean d'Angely, Saintes, and Tonnay Charente. Rochefort is one of the great naval ports of France. La Rochelle was the strong-hold of the Huguenot party, until they were humbled by the power of the Crown and the ability of Richelieu.

The Isle of Oléron extends about 20 miles in length from N.N.W. to S.S.E.; and about [illegible] miles in breadth. (Brué's *Map of France*). It is nearly surrounded by shoals, and a ledge of rocks runs along a considerable part of the S.S.W. coast toward the open sea; there are rocks also about the northern point. Oléron is separated on the S.E. side from the main land by the narrow strait, Passe de Maumusson, and on the N.E. by the bay, Pertuis d'Antioche, which also separates it on the N. from the isle of Ré. This island was called by the Romans Uliarus, which name occurs in Pliny; at a later period we find, in Sidonius Apollinaris, the derived adjective *Olurionensis*, which serves to mark the transition to the modern name of Oléron. The soil of this island is calcareous, and fertile in corn and wine, and its salt-marshes yield much salt. It contains about 16,000 inhabitants. The little town of Oléron is on the E. side of the island, opposite to the main land; it contains about 3000 inhabitants, and is defended by a strong castle. Salt, wine, and brandy, the staple productions of the island, constitute the chief articles of the trade of the town which was once deemed of sufficient importance to be the seat of a bishopric. The town of St. Pierre d'Oléron is situated near the centre of the island, and had in 1832 a population of 4630 for the whole commune. At the north end of the island is the tower of Chassiron, where is a lighthouse to guide vessels by night into the Pertuis d'Antioche.

The isle of Ré is about 16 miles in length, from W.N.W. to E.S.E., and about 3 or 4 miles in breadth. The Pertuis d'Antioche separates it on the S. from the isle of Oléron and the Pertuis Breton, and a strait which connects these two bays separates it on the N.E. and E. from the main land. It is nearly surrounded by rocks and shoals. We do not meet with any mention of this island by name in the Roman writers. The anonymous geographer of Ravenna calls it Ratis; in the middle ages we meet with it under the name Radis. The climate of the island is mild and temperate; the soil is every where sandy, and destitute of water. The island contains neither spring nor brook, and the only water the inhabitants can obtain is sea water, filtered through the sand. This they procure by merely digging to the depth of three or four feet; but it has not lost its acridity and saltness, and those who have not been accustomed to drink it find difficulty in reconciling themselves to it at first. The island has neither wood nor pasturage; some cows are kept, which are fed upon a plant which grows along the shore under the water, and which is gathered and dried for fodder. Little grain is grown in the island, though barley and oats succeed tolerably well. A considerable quantity of white wine of middling quality is produced, and much brandy distilled. The principal fruits cultivated are figs and almonds. The population of this island is probably nearly equal to that of Oléron.

The coasts of the island present a succession of well-sheltered bays, roadsteads, and harbours, of which the best are those of St. Martin de Ré, Ars, and La Flotte. St. Martin de Ré has a square citadel, fortified with bastions and other works, which defends the harbour and the town. Though the town is small, it is well-built and handsome. It has a fine arsenal and a military hospital. The inhabitants in 1832 were 2489 for the town, or 2581 for the whole commune; they trade in salt, wine, brandy, and vinegar; and in deals (planches), which last are imported by the Prussians or Dutch; they are engaged also in the cod and thornback fishery. Ars had in 1832 a population of 2410 for the town, or 3875 for the whole commune. The adjacent marshes yield salt, and in the neighbourhood are collected transparent pebbles, white, yellow, brown, and rose-coloured, which yield not in brilliancy to the pebbles of Médoc. La Flotte had in 1832 a population of 2452 for the town, or 2557 for the whole commune.

The isle of Aix is very small; it lies in the Pertuis d'Antioche, between the isle of Oléron and the main land. It contains about 200 or 300 inhabitants, but it is fortified. A French fleet of nine or ten sail of the line, lying off this island, was attacked in the evening of the 11th April, and on the 12th April, 1809, by a squadron of British frigates, fire-ships, and other vessels, under Lord Cochrane, detached from the British fleet under Lord Gambier. Three ships of the line were taken and destroyed, and another ship of the line was destroyed by the French, to prevent capture; some other vessels were driven on shore.

The Isle of Madame at the mouth of the Charente is also fortified.

The department of Charente Inférieure constitutes the diocese of La Rochelle. It is in the jurisdiction of the Cour Royale, or Assize Court, of Poitiers; and in the twelfth military division, of which Nantes is the capital. It sends seven members to the Chamber of Deputies. (Malte Brun; Balbi; *Encyclopédie Méthodique*; *Dictionnaire Universel de la France*.)

CHARENTON, a small town (*bourg*) in France, in the department of Seine, about two miles from the barriers of Paris; it is on the right bank of the Marne, just above its confluence with the Seine. A bridge, partly of stone and partly of wood, connects it with the village of Alfort on the opposite bank. Charenton is pleasantly situated, and contains several country houses, and a building called *Le Château*, once the residence of Gabrielle d'Estrées, mistress of Henry IV., built for her by that king. The population, in 1832, was only 1925 for the town, or 1981 for the whole commune. There is an extensive iron-foundry and manufactory of cylinders for cotton-printing.

The bridge of Charenton has always been regarded as one of the keys of Paris on that side, and has consequently been an object of contest in the wars of the French, foreign or domestic. In the contests with the Normans in the ninth century, and with the English in the fourteenth and fifteenth; in the war of the *Ligue du Bien Public*, League of the Public Weal, against Louis XI., of the Huguenots and Catholics, of Henry IV. and the Leaguers, possession of it was disputed. A tower near this bridge was defended in 1590 against Henry IV. by ten Parisians, whom, upon their surrender, the king hung. In the battle of Paris, March, 1814, this bridge was bravely but unsuccessfully defended by the pupils of the veterinary school of Alfort.

When the edict of Nantes, March, 1598, guaranteed to the Protestants the full exercise of their religion, those of Paris were allowed to have their place of worship at Ablon, a village on the bank of the Seine, several miles south of Paris; but the distance being inconveniently great, they were allowed, in 1606, to remove their worship to Charenton. It was commenced August 27, that year; the Protestants assembled to the number of 3000, and the violence of the mob, who were excited against them by the Catholic priests, was restrained by a body of archers sent by the king to protect the worshippers. The Protestants were continually, however, exposed to insult and violence. In 1621 the congregations returning from Charenton were attacked by a set of armed robbers and other vagabonds, instigated by some secret enemies of the Protestants; the minister was maimed, several persons were killed, and their place of worship was burnt.

The Protestant church was rebuilt on a large and more magnificent plan, and finished in 1623, when the Protestants held their national synod there. Its inside dimensions were 104 feet by 66. There were near it a library, a printing-office, and booksellers' shops, principally intended for the printing and sale of their religious publications. In August, 1685, a new attempt was made by the mob on this church; two shops adjoining to it were burnt, and the church itself narrowly escaped. Upon the revocation of the edict of Nantes, a few weeks afterwards, the demolition of all the Protestant churches remaining in France was ordered; the demolition of that of Charenton was commenced the very evening of the day on which the Act of Revocation was registered, and, in five days, the church was entirely destroyed, the library, printing-office, and minister's house sharing the same fate. The materials were given to the Hôtel Dieu, at Paris. The celebrated Jean Claude, whose talents caused him to be regarded as the head of the Protestant party in France, was minister of Charenton at the time of the suppression of the Protestant worship.

There is at Charenton an asylum for pauper and other lunatics. The establishment originated in 1741; it was founded by one Sebastien Leblanc, and was under the management of the *Frères de la Charité*; but it has since been modified and enlarged. The number of patients is now above 400. The treatment is peculiar; the influence of music and of dramatic entertainments in which the parts were sustained by patients who had lucid intervals, has been tried, [illegible] ent is said to have been successful.

CHARES [illegible] Master of the Ceremonies to Alexander the [illegible] e a collection of anecdotes, or perhaps rather [illegible] t of the private life and adventures of the king. We may judge from the fragments in Athenæus that this work contained numerous details which were exceedingly curious and interesting. (Athenæus, *Deipn.* Casaub.)

CHARES. [RHODES.]

CHARGE, in the practice of artillery, denotes the quantity of powder placed in a gun, howitzer, or mortar, for the purpose of expelling the shot or shell by its explosion.

The service-charge varies from one-sixth to one-third of the weight of the projectile: the lower charges being used in the field, or in naval actions; and the higher in breaching the walls of fortresses. It is evident that extensive ranges and great velocities of shot are not required when artillery is directed against an enemy's columns or lines; and it is found by experiment that a ball which just pierces the timbers of a ship will fracture them more than if it passed rapidly through them. On the other hand, the greatest momentum is necessary on commencing the formation of a breach in a rampart faced with brick or stonework, as the depth to which the shot will penetrate is thereby increased, and therefore the highest charges are then required.

According to Dr. Hutton (Tract [illegible]) different charges of powder, when the weight of the ball remains the same, produce velocities which are as the square roots of the weight of powder; and, when the weight of powder is the same while that of the ball varies, the velocities are inversely proportional to the square roots of the weight of the balls. The Doctor states, also, that the greatest velocities are produced in guns, the lengths of whose bores are equal to fifteen, twenty, and thirty calibres, or diameters, by charges occupying [illegible] and [illegible] of the lengths of the bores respectively; and he adds, that by increasing the quantity of the charge, the velocities increase till they amount to a certain value, after which they decrease till the bore is quite filled with powder. The charge producing the maximum velocity is greater as the gun is longer; but it does not increase in so high a ratio as the length of the gun.

CHARGE' D'AFFAIRES, one who transacts diplomatic business at a foreign court during the absence of his superior, the ambassador. The agents that bear this name also form a separate class, being the chosen envoys or residents at the states to which other states do not appoint diplomatists of the higher grades. In this capacity the Chargés d'Affaires act for themselves, represent their country, and are independent of any ambassador. In the ordinary routine and course of promotion, the secretary of legation, or secretary of embassy, becomes a Chargé d'Affaires, but individuals are not unfrequently elected on other grounds of fitness or ministerial patronage, and without having gone regularly through the subordinate grades of the profession. It now seems to be the practice to appoint *resident ministers* (a class above *Chargés d'Affaires*, but beneath envoys, ordinary and extraordinary, and ministers plenipotentiary) rather than Chargés d'Affaires. In this year (1836) the only British Chargé d'Affaires on the diplomatic list is one to Mexico. In the article 'Ambassador,' the gradations of diplomatic rank and etiquette are fully explained.

CHARIOT, a light sort of coach; also, a car, in which men of arms were placed in fight. The name is derived from the French word *charrette.* Cars or chariots are of very early use. The invention of them was attributed by the Greeks to Minerva (Hom. *Hymn. in Ven.* v. 12), on which account she was venerated at Athens and various other places in Greece under the name of Hippia: and the honour of the invention was shared by Erichthonius, who, according to Virgil, was supposed to have first harnessed horses to a car, and to have introduced chariot-races at the Panathenæa which were established by him.

The most antient war-chariots we know of are those of Pharaoh, which were overwhelmed in the Red Sea. (*Exod.* xiv. 7.) The Canaanites whom Joshua engaged at the waters of Merom had a multitude of chariots. (*Josh.* xi. 4.) And the Philistines, in their war against Saul, are stated (1 Sam. xiii. 5) to have had thirty thousand.

Chariots armed with scythes were in use for many ages, in all the Eastern countries, and were regarded as a principal arm of war. Such are mentioned in the Second Book of Maccabees (ch. xiii. v. 2), which the king of Syria led against Judæa. They were used by the Persians, as we see from Xenophon (*Anab.* i. 8); and they constituted a remarkable feature in the armies of the antient Britons. Cæsar (*De Bell. Gall.* v. 19) says, that after Cassivellaunus had dismissed all his other forces, he had still four thousand of these war-chariots about his person. See Cæsar's account of the method used in fighting with them (iv. 33).

The Essedum and the Rheda were among the Roman war-chariots of the larger size. Greek and Roman chariots frequently occur on the reverses of medals.

CHARITE', LA, a town in France, in the Department of Nièvre, on the right bank of the Loire, between Nevers and Cosne. It is 119 miles from Paris, in a straight line S. by E., or 126 miles by the road through Fontainebleau, Montargis, Briare, and Cosne: and 14 or 15 miles from Nevers, the capital of the department. It is in 47° 11′ N. lat., and 3° 2′ E. long.

This town is built near the site of a more antient one, which had the name of Seyr. About the year [illegible] a powerful noble built and endowed a monastery on the bank of the Loire, near this town of Seyr; and the town of *La Charité*, which took its name from the abundant alms of the religious, rose round this monastery and caused the downfal of its more antient neighbour. Within a century after its foundation the rising town twice attracted the cupidity and experienced the violence of a barbarous tribe, whom Expilly designates as Vandals. In the religious wars of the sixteenth century, it was pillaged and burnt by the Huguenots, to whom it was betrayed by some of the inhabitants, and abandoned by the governor.

Before the Revolution, there were several religious houses in the town; the Benedictine Priory of the order of Cluny was richly endowed; the building was one of the finest in the kingdom, and the prior was spiritual and temporal lord of the town.

La Charité has well-built houses, and a pleasant public walk on the banks of the river; there is also a good bridge over the Loire, across which the road to Bourges passes, and a fine Gothic church in ruins.

The population in 1832 was 4480 for the town, or 5086 for the whole commune. The chief manufactures are of iron, steel, and other metal goods, especially buttons, buckles, helmets, bayonets, and side arms. Some woollen cloths are made, also glass and earthenware. The articles of trade, beside the foregoing, are wood and hats.

CHA'RITON, the author of a Greek romance in eight books, entitled 'The Loves of Chaereas and Callirrhoë.' The writer calls himself Chariton of Aphrodisias: the time at which he lived is uncertain, but probably not earlier than the fourth century of our æra. Though this, like most other Greek romances, displays little invention, it has some merit in point of style. Chariton was published by D'Orville, Amsterdam, 1750, 3 vols., 4to., with a valuable commentary. It is translated into German by Sc[illegible]eder, Leipzig, 1806, 8vo.; and into French by Larcher.

CHARKOW (pronounced Kharkoff), a town in southern Russia, in 50° N. lat., and about 33° 30′ E. long., between two small rivers, the Charkowa and the Lopan, which fall into the Donecz, one of the largest tributaries of the Don. Charkow is the capital of the government, now called Slowodesk Ukraine, but formerly the government of Charkow, and may be considered as being placed on the boundary-line between the fertile country which extends over the centre of Russia, and the large deserts known under the names of steppes, which occupy the southern districts of the empire. This town, which contains about 18,000 inhabitants, has been chosen by the Russian government as the centre of instruction for the southern provinces. The university, which was erected in 1803, was attended in 1831 by 318 students. Connected with it is a botanic garden, a collection of natural objects, an observatory, and a library of 20,000 volumes. There is also a seminary for clergymen, a military academy for forty children of poor noblemen, a grammar-school, and an institute of education for young ladies, with some other schools. In modern times a philotechnic society has been erected, whose object is the establishment of manufactures in this part of Russia. There is more industry in this town than in many others of Southern Russia; but it is almost exclusively limited to [illegible]*nikis* (coats of Cossacks), *charawaris* (trowsers of Cossacks), and *coxis* (carpets and cloaks made of felt). This branch of industry supplies the principal articles of sale at the four fairs which are held annually at this place, and are visited by many merchants from the interior of Russia.

CHARLEMAGNE, KARL DER GROSS, or Charles the Great, son of Pepin le Bref, king of the Franks, and of

Bertha, daughter of Caribert, Count of Laon, and grandson of Charles Martel, was born about 742 in the castle of Salzburg in Bavaria, a country which Pepin had conquered, as well as part of Saxony. Pepin died in 768, and Charles and Carlomann, his sons, succeeded to the vast dominions of the Franks. Charles had Austrasia and Neustria, with part of Germany; Karlomann had Burgundy and South Gaul. Karlomann died in 771, leaving two infant sons, but Charles possessed himself of his dominions; and Karlomann's widow, with her children, took refuge at the court of Desiderius, king of the Longobards. Charles was now sovereign of the whole Frankish monarchy, which extended not only over the present France, but also over nearly one-ha[illegible] Germany. The Franks were still, in a great measure, a German nation; and the native language of Charles was a dialect of the Teutonic. In 772 Charles began his wars against the Saxons, which continued with various interruptions till 803. Witikind, the principal chief of the Saxons, a cunning and brave barbarian, gave him full employment for many years. The Saxons were Pagans and Charles and his Franks seem to have felt little scruple in massacring them by thousands, even after they had laid down their arms. In 774 Charles being applied to by Pope Adrian I. against Desiderius, king of the Longobards, who threatened Rome, hastened from Germany to Italy, crossed the Alps by the pass of Susa, defeated Desiderius at Pavia, and took him prisoner. He assumed the crown of Lombardy, and confirmed Pepin's donation of the Exarchate of Ravenna and the Pentapolis to the Pope, who on his part acknowledged Charles as Patrician of Rome and Suzerain of Italy, with the right of confirming the election of the popes. In 775 Charles proceeded again to Germany against the Saxons. In the following year he returned to Italy to quell some insurrections; in 778 he went to Spain against the Saracens, and conquered part of Catalonia, Aragon, and Navarre; but on recrossing the Pyrenees, his rear guard was defeated at Roncesvalles by the Vascones and the Saracens united. Several nobles of Charles's court fell on that day, among whom was Roland, warden of the borders of Brittany, 'Præfectus Brittannici Limenis,' who has become the hero of many a romantic tale. In 780 Witikind having defeated several bodies of Franks, Charles found it necessary to visit Germany again in person; and after several sanguinary campaigns, Witikind was obliged to submit and receive baptism. The alternative of death or Christianity was held out to thousands of the Saxons, who generally preferred the latter; and Charles, by transplanting whole colonies of them into remote parts of France or Italy, broke their strength. Tassilo, Duke of Bavaria, a feudatory of [illegible] Frankish monarchs, having assisted or connived at Witikind's incursions, Charles invaded Bavaria, and brought the duke before the diet of the great lords assembled at Ingelheim, where Tassilo was found guilty of treason and condemned to death. Charles spared his life, but had [illegible] c[illegible]ed in a convent in 794. As for Witikind, he lived the rest of his days in peace, on his domains in the north of Germany, and his posterity is said to be perpetuated in the House of Oldenburg, the stock of the present reigning houses of Denmark and Russia. (Dunham's *History of the Germanic Empire.*) In the year 800 Charles being victorious everywhere, and master of the best part of Europe, visited Rome, where he was solemnly crowned Emperor of the West by Pope Leo III., with the title of Carolus I. Cæsar Augustus. He was called by the historians Carolus Magnus, from which the French have made Charlemagne; German writers call him Karl der Gross. Nicephorus I., Emperor of Constantinople, sent an embassy to Charles by which he acknowledged him Emperor of the West, with the title of Augustus, defining at the same time the limits between the two empires, which seem to have been the Raab in Hungary, and the mountains of Carniola down to the Gulf of Istria; and in Italy, the old boundary between the duchy of Benevento, and the Greek possessions in Apulia and Magna Græcia. Charlemagne had therefore Germany, the Netherlands, the Gauls, the greater part of Italy and Spain as far as the Ebro, with the Balearic islands, Corsica and Sardinia. He was on good terms with the Saxon kings of Britain. The caliphs of Bagdad sent embassies to him. From the Ebro to the mouth of the Elbe, from the Atlantic to the mountains of Bohemia and the Raab, and from the British Channel to the Volturno—was the extent of his dominions. Bohemia, which was then inhabited by Sclavonian tribes, he never subjugated. About 807 or 808, the first mention occurs in history of the Normans and Danes making descents on the coast of France. Charlemagne seems to have felt the danger of this new enemy, for he took great pains to fortify the extensive coast line of his dominions; he stationed armed vessels in every harbour, and made Boulogne one of his principal naval stations. In [illegible] Charlemagne named his third [illegible] Louis, called afterwards Louis le Débonnaire, his colleague in the empire. He had lost his two elder sons, Pepin and Charles; but he appointed Bernard, the son of Charles, king of Italy. In January, 814, Charlemagne died of pleurisy at Aix-la-Chapelle after a reign of forty-seven years. He was buried with great pomp in the cathedral at Aix-la-Chapelle.

Charlemagne may be considered the principal regenerator of Western Europe after the destruction of the Roman empire. He was ambitious, but his [illegible] was of an enlarged kind, and led to [illegible] lts. He was not merely a successful [illegible] tesman and a legislator; and his [illegible] lly enlightened when contrasted wi[illegible] nded him. He was the first to [illegible] obedience [illegible] iscipline among the turbulent Franks [illegible] he effect[illegible] curbed the insubordination of his vassals, which his [illegible] r Pepin had been unable to subdue. He was the [illegible] der of the Germanic empire, having transformed tribes of lawless barbarians, such as the Saxons, the Bavarians, the Frisians, &c., into a federation of civilized nations. His predecessors, Charles Martel and Pepin, had checked the advance of the Saracens on the side of the Pyrenees; Charlemagne drove them back beyond the Ebro. His overthrow of the Longobards in Italy has been viewed in various lights by party historians. He has been considered by some as having, by his alliance with the popes, favoured the encroachments of their spiritual power over temporal affairs. But it ought to be observed that in his life-time at least he always asserted the superiority of the empire over the church in temporal matters, that he crowned himself king of Italy, and that even at Rome the laws were proclaimed in his name, 'Imperante Domino nostro Carolo,' and the coin bore his stamp. Other writers have assumed that the overthrow of the Longobards was a misfortune to Italy, because they have fancied that their power was likely to effect that union of the Peninsula which has been the favourite vision of the Italians in all ages. But that union, had it been possible, was more likely to be effected by a sovereign like Charlemagne, who ruled singly and firmly over his vassals, and who was acknowledged as emperor of the West and successor to the Cæsars, than by an elective king like that of the Longobards, who was every moment at variance either with some one of the numerous dukes, who ruled absolutely each his respective territory, or with the Greek emperors, who still retained nearly one half of Italy. Besides, it ought not to be forgotten that the Longobards, even under their best kings, always retained a broad distinction between themselves the conquerors, and the Romans or conquered race. This humiliating and often oppressive distinction Charlemagne abolished, and by so doing he in fact emancipated the original Italian population from bondage. Those who may wish to look further into this often misstated question will find a sober and argumentative discussion of it in Manzoni's *Discorso storico sopra alcuni punti della Storia Longobardica in Italia*, which accompanies his historical drama of Adelchi. Charlemagne promoted instruction by the only means then known, by founding monasteries and endowing churches with schools attached to them. He enacted a series of regulations upon civil and ecclesiastical matters which may be considered as forming a code of laws. [CAPITULARIES.] He often assembled diets of the great lords and bishops, and consulted them upon important matters, thus showing a deference to the opinion of the only classes that had then any pretensions to education. Upon the sa[illegible]le, he favo[illegible] clergy as being the only [illegible]ars of that age. Al[illegible] Paulus Diaconus, and [illegible]ed men, were honou[illegible] with his favour. He was easy of access to the humble and poor, and showed himself just and merciful towards them. [illegible] was, on the contr[illegible], at times harsh and cruel to [illegible] enemies and to his rebellious subjects, whom he treated [illegible] the same manner that they treated their [illegible] of [illegible] His first wife was Her-

Lutgarde,
hard, Vita

being on the right
Charlemont … on the left. Charlemont
is rather … a straight line N.E. of
Paris, or 165 miles … Laon and Avesnes,
50° 8′ N. lat., and

Charlemont is a place of mode… ; it was originally a fortress, built by the Emperor Charles V., and united by him, in the year 1555, to the territory of Namur. It derives its name from its founder, and from its situation on a steep eminence. By the treaty of Nimeguen, in 1678, it was ceded to France, and Louis XIV., desirous of enlarging the fortress, caused the adjoining villages or towns of Givet, one lying at the foot of the hill on which Charlemont was built, the other on the opposite bank of the river, to be fortified. The fortifications of Charlemont are partly of the time of Charles V., but the fortifications of Givet, and the out-works of the whole, are by Vauban. The whole constitute a fortress of the first class.

The town of Charlemont is small and of irregular form, but the streets are well laid out, and the houses good. Givet St. Hilaire has a large and well laid out *place*, or open space, and fine barracks. Givet Notre Dame is traversed by the little river Houille, which here empties itself into the Meuse: the circuit of its fortifications comprehends a considerable space, which was not built upon when Expilly wrote (1762), and as the population has not materially increased, is probably still vacant. The two Givets are connected by a bridge over the Meuse.

The inhabitants in 1832 amounted to 4092 for the town, or 4220 for the whole commune. Considerable trade is carried on: the inhabitants manufacture leather, esteemed the best in France, glue, and earthenware; there are several breweries, and a brass-foundry. The situation of the town on the river Meuse is favourable to its commerce, which is however checked by some of the custom-house regulations, which impede the communication of France with Belgium. Charlemont is celebrated for the beauty of the women: indeed the inhabitants generally are handsome.

Méhul, the celebrated composer of music, was a native of Givet.

CHARLEROY, or **CHARLEROI**, a town in the province of Hainault, in Belgium, situated on the banks of the Sambre, 20 miles E.S.E. from Mons, and 33 miles S. from Brussels, in 50° 23′ N. lat., and 4° 25′ E. long. This town, with the whole of Hainault, was united to the French republic, and formed part of the department of Jemmapes. In 1814 it became part of the kingdom of the United Netherlands; and in 1815, during the hundred days, it being in possession of the Prussians, they were attacked by Napoleon, and driven from it a few days before the battle of Waterloo. Since the general peace, the fortifications have greatly improved.

… town is built in the form of an amphitheatre, on the
… a steep hill, which rises from the banks of the
… It contained, in 1830, 932 houses, inhabited by
… containing 5908 individuals. There is reason
… that since the last enumeration, the population
… increased.

… tanneries, dye-houses,
t … and factories for
But … are
and iron … both of
lly increasing in … importance.
mine … re are 72
… 900
of which is

what is called *houille maigre*,
century, the entire quantity p…
exceed 50,000 tons.

In 1828 there was in the … only one furnace for
smelting iron with coke; at … revolution in
1830, there existed four; at p… re are twelve
at work, and twenty-nine new furna… in the course
of construction, some of which are n… ted, and all
will be put to work in twelve mont… iron-works
are all so near together that the whole … from one
spot. Every thing required for building and setting these works in action is found on the spot, with the exception of clay for making bricks, which is brought from Huy. When the whole of these furnaces shall be in action, it is estimated that they will produce about 100,000 tons of iron per annum, and employ about 3000 workmen.

The district presents great facilities for water-carriage, and in a short time Charleroy will be connected by means of railroads with most of the principal towns of Belgium; the high roads from Brussels, Mons, and Namur meet at Charleroy.

CHARLEROY, CANAL OF. [BRUSSELS.]

CHARLES I., King of England, the third son of James I. and Anne, daughter of Frederick II., King of Denmark, was born at Dunfermline, in Fifeshire, North Britain, on the 19th of November, 1600. James's second son, Robert, having died in infancy, and his eldest, Prince Henry, in his nineteenth year, in 1612, Charles became heir-apparent to the crown. He was not however created Prince of Wales till the 1st (other authorities say the 4th) of November, 1616. His title before this was Duke of York and Cornwall.

Almost the only transaction in which Charles figured before he ascended the throne was the extraordinary expedition to Spain made at the suggestion and in the company of the Duke of Buckingham, in the year 1623, to conclude in person the negociations for his marriage with the Infanta Maria, a business which had occupied his father for nearly the preceding seven years. The affair was probably prevented from being brought to the intended conclusion by this very journey. After it was broken off, Charles and his father directed their views to a French match, the negociation for which was in progress when James died, on the 27th of March, 1625. The new king's marriage with the Princess Henrietta Maria, the youngest daughter of Henry IV., was solemnized by proxy, at Paris, on the 11th of May.

At the accession of Charles, circumstances and the minds of men were ripe for a renewal of that struggle between the popular and the monarchical principles of the constitution, which his predecessor had with difficulty put down, when it broke out in the parliament assembled in 1620. Charles began his reign by retaining as his chief adviser his father's favourite, the unpopular, unprincipled, and incapable Buckingham. At the same time the difficulties in which he was involved by the war that had just been entered into with Spain, offered to the popular party an opportunity of pursuing their objects, which seemed too [illegible] neglected.

The reign commenced accordingly with a contest between the king and the parliament, the latter firmly refusing to grant the supplies demanded by his majesty until they had obtained both a redress of grievances and a limitation of the prerogative. Charles on his part met the resistance of the parliament both by insisting upon preserving the prerogative entire, and by boldly putting it in force. In the course of this first contest three parliaments were successively called together and dismissed. The first met 13th June, 1625, and was dissolved 12th August, in the same year; the second met 6th February, 1626, and was dissolved, before it had passed a single act, 15th June; the third met 17th March, 1628, was suddenly prorogued 26th
June, was called … ther for a second session 20th January,
1629, and was fin… dissolved 10th March of the same year.
All this time the … edings of the king continued to be
of the most arbi… character. Money was collected from
the people by … he influence of the crown was exer-
cised in the … n manner to overawe the judges, in
cases in which the … berty of the subject was concerned;
the first … ment itself was violated by the
seizure … the House of Commons, and their
commitment to prison, for … to have been spoken
by them in debate. … e from the charge of
re … ying and subterfuge to es-
the … which he was pressed. He is
… of such insincerity and du-